U 3770-1 UA
rec'd 9/29/80

BULLETIN OF BUSINESS RESEARCH

STATISTICAL SUMMARY

Center for Business and Economic Research

The Ohio State University

Volume LV, Number 7 • July 1980

Business Conditions in Ohio and the United States

ITEM	Unit or Index Base Period	OHIO May 1980 (p)	OHIO Apr. 1980 (r)	OHIO Change From Last Month: May 1980 from Apr. 1980	OHIO Change From Last Year: May 1980 from May 1979	OHIO Change From Last Year: 5 months 1980 from 1979	UNITED STATES May 1980 (p)	UNITED STATES Apr. 1980 (r)	UNITED STATES Change From Last Month: May 1980 from Apr. 1980	UNITED STATES Change From Last Year: May 1980 from May 1979	UNITED STATES Change From Last Year: 5 months 1980 from 1979
GENERAL BUSINESS				%	%	%			%	%	%
• Bank Debits[5, 11]	1967[f]	n.a.	n.a.	n.a.	n.a.	n.a.	Bil. $ Ex. NY[d, h]	n.a.	n.a.	n.a.	n.a.	n.a.
Commercial Failures—Number[12]	Number	n.a.	n.a.	n.a.	n.a.	n.a.	Number	n.a.	n.a.	n.a.	n.a.	n.a.
Commercial Failures—Liabilities[12]	Thous. Dol.	n.a.	n.a.	n.a.	n.a.	n.a.	Thous. Dol.	n.a.	n.a.	n.a.	n.a.	n.a.
Life Insurance Sales[6]	1967	346	371	— 7	+ 5	+ 11	1967	383	394	— 3	+ 7	+ 13
INCOME												
• Total Personal Income[1, 13]	Mil. Dol.[d, h]	99,058	99,379	— x	+ 7	+ 9	Bil. Dol.[d, h]	2,070	2,067	+ x	+ 9	+ 10
Salaries & Wages Income[7, 13]	Mil. Dol.[d, h]	c	c	— 4	— 6	— 1	Bil. Dol.[d, h]	1,306	1,307	— x	+ 8	+ 9
Nonagricultural Income[13]		b	b	b	b	b	Bil. Dol.[d, h]	2,030	2,026	+ x	+ 10	+ 11
Employee Earn.—Gross Wkly.: Mfgr.[14, 15]	Dollars	336.04	337.34	— x	+ 3	+ 5	Dollars	280.53	278.95	+ 1	+ 6	+ 7
" " " Const.[14, 15]	Dollars	449.07	432.98	+ 4	+ 3	+ 9	Dollars	357.19	351.86	+ 2	+ 5	+ 7
Agr. Income (Cash Mktgs.)[16, 17]	1957–59	n.a.	n.a.	n.a.	n.a.	n.a.	1967					
EMPLOYMENT & UNEMPLOYMENT												
Civilian Labor Force[14, 15]	Thousands	5,035	4,957	+ 2	+ 1	— x	Thousands	104,028	103,412	+ 1	+ 3	+ 2
Civilian Employment[14, 15]	Thousands	4,596	4,595	+ x	— 3	— 2	Thousands	96,709	96,566	+ x	+ 1	+ 1
Nonagricultural Employment[14, 15]	Thousands	4,433	4,445	— x	— 2	— x	Thousands	93,273	93,485	— x	+ x	+ 1
Mfg. Prod. Employment[7, 15]	1967	68	72	— 5	— 17	— 11	1967	99	101	— 1	— 5	— 2
• Mfg. Prod. Payrolls[7, 15]	1967	157	168	— 7	— 15	— 9	1967	242	245	— 1	— 1	+ 3
Average Weekly Hours—Mfg. Prod.[7, 15]	Number	40.1	40.4	— 1	— 4	— 2	Number	39.4	39.4	+ x	— 2	— 1
Unemployment, Total—No.[14, 15]	Thousands	439	363	+ 21	+ 78	+ 23	Thousands	7,318	6,846	+ 7	+ 39	+ 17
Unemployment, Total—Rate[14, 15]	Percent	8.7	7.3				Percent	7.0	6.6			
Unemployment, Insured[14, 15]	Thousands	212	193	+ 10	+120	+ 67	Thousands	3,683	3,629	+ 1	+ 65	+ 30
Registered for Work, O.B.E.S.[14]	Thousands	383	384	— x	+ 14	+ 14		b	b	b	b	b
Unemployment Compensation Fund[14]	Mil. Dol.	325	247	+ 31	— 42	— 22		b	b	b	b	b
PRODUCTION												
Gross National Product (Quarterly)[13]		b	b	b	b	b	Bil. Dol.[d, h]	n.a.	n.a.	n.a.	n.a.	n.a.
Industrial Production[7, 11]	1967	c	c	— 7	— 20	— 14	1967[d]	146	149	— 2	— 5	— 1
• Steel Production[18]	Thous. Tons	1,371	1,596	— 14	— 34	— 19	Thous. Tons	226	10,658	— 13	— 28	— 12
Electric Power Production[8]	1967[f]	n.a.	n.a.	n.a.	n.a.	n.a.	Mil. KWH	n.a.	n.a.	n.a.	n.a.	n.a.
Bituminous Coal Production[19]	Thous. Tons	4,320	4,197	+ 3	+ 19	+ 3	Thous. Tons	n.a.	73,135	n.a.	n.a.	n.a.
Pig Iron Production[18]	Thous. Tons	939	1,065	— 12	— 32	— 18	Thous. Tons	5,906	6,677	— 12	— 29	— 13
Machine Tools—Shipments[20]		b	b	b	b	b	Mil. Dol.	n.a.	344.00	n.a.	n.a.	n.a.
Machine Tools—New Orders[20]		b	b	b	b	b	Mil. Dol.	n.a.	414.95	n.a.	n.a.	n.a.
Durable Goods—New Orders[13]		b	b	b	b	b	Mil. Dol.[d]	67,428	72,218	— 7	— 2	— 4
CONSTRUCTION (Value of Contracts)												
• Total (Seas. Adj.)[9, 21]	1967[d]						1967[d]					
Total[9, 21]	1967[f]	147	160	— 8	— 43	— 24	Mil. Dol.	11,135	11,071	+ 1	— 31	— 26
Residential Building[9, 21]	1967[f]	142	133	+ 7	— 56	— 44	Mil. Dol.	4,495	4,373	+ 3	— 44	— 31
Nonresidential Building[9, 21]	1967[f]	129	136	— 5	— 36	— 5	Mil. Dol.	4,135	4,063	+ 2	— 7	— x
Utilities and Non-Building Const.[9, 21]	1967[f]	204	284	— 28	— 20	— 15	Mil. Dol.	2,505	2,635	— 5	— 33	— 44
DISTRIBUTION												
Total Retail Sales[2, 13]	1957–59[d]	287	289	— 1	— 3	+ 1	Mil. Dol.[d]	74,265	75,011	— 1	+ 3	+ 7
Department Store Sales[2, 13]	1957–59[d]	258	272	— 5	+ 6	+ 3	Mil. Dol.[d]	7,727	7,468	+ 3	+ 6	+ 9
• New Passenger Cars Registered[3, 22]	1967	83	96	— 13	— 43	— 22	No.–49 sts.	733,229	783,741	— 6	— 26	— 14
New Trucks Registered[3, 22]	No.–44 cos.	3,734	4,562	— 18	— 49	— 42	No.–48 sts.	206,868	220,595	— 6	— 35	— 27
Used Cars Registered[3]	No.–33 cos.	31,501	33,070	— 5	— 30	— 11		b	b	b	b	b
PRICES												
• Consumer Price Index[15]:												
All Urban Consumers		b	b	b	b	b	1967	245	243	+ 1	+ 14	+ 14
Wage Earners & Clerical Workers		b	b	b	b	b	1967	245	243	+ 1	+ 14	+ 14
Producer Price Index[15]:												
All Commodities		b	b	b	b	b	1967	264	262	+ 1	+ 14	+ 15
Finished Goods		b	b	b	b	b	1967	241	240	+ x	+ 13	+ 13
Intermediate Materials		b	b	b	b	b	1967	276	275	+ x	+ 16	+ 17
Crude Materials		b	b	b	b	b	1967	301	297	+ 1	+ 7	+ 10
Sensitive Indus. Commodities[15]		b	b	b	b	b	1967	279	302	— 8	— 5	+ 9
BANKING AND FINANCE												
• Bank Loans, Large Banks—Total[11]	Mil. Dol.	25,168	25,803	— 2	+ 20	+ 20	Mil. Dol.	404,287	411,475	— 2	+ 9	+ 13
" " " " Buc. & Agric.[11]	Mil. Dol.	9,127	9,378	— 3	+ 15	+ 19	Mil. Dol.	161,940	166,147	— 3	+ 10	+ 15
Stock Price Index—400 Indust.[23]		b	b	b	b	b	1941–43 = 10	121.0	113.7	+ 6	+ 10	+ 9
" " " 40 Utils.[23]		b	b	b	b	b	1941–43 = 10	50.1	48.5	+ 3	+ 4	— 3
" " " 20 Trans.[23]		b	b	b	b	b	1970 = 10	15.2	14.6	+ 4	+ 10	+ 14
Yield, Corp. AAA Bonds[23]		b	b	b	b	b	Percent	10.78	11.09	— 3	+ 14	+ 25

• Indicates series charted (page S-1). For sources and footnotes, see page S-3.

Business Conditions in the 8 Largest OHIO CITIES

ITEM	Unit or Index Base Period	May 1980 (p)	Apr. 1980 (r)	Change From Last Year: May 1980 from May 1979	Change From Last Year: 5 months 1980 from 1979
AKRON				%	%
Number Employed[7]:					
Total[w]	1967	79	79	— 6	— 5
Manufacturing	"	56	57	— 12	— 11
Trade, Serv., & Utils.	"	109	109	— 1	— x
Construction	"	50	50	— 28	— 12
Payrolls[7]:					
Total[w]	"	173	172	+ 1	+ 2
• Manufacturing	"	128	126	— 1	— 3
Trade, Serv., & Utils.	"	264	267	+ 5	+ 7
Construction	"	122	111	— 22	— 5
Emp. Earn.—Gross Wkly.[7]:					
All Industries[w]	$	332.73	329.13	+ 9	+ 8
Manufacturing	"	390.64	382.06	+ 12	+ 9
Trade, Serv., & Utils.	"	249.03	255.23	+ 5	+ 7
Construction	"	467.78	422.11	+ 9	+ 8
Retail Sales[2]	%	c	c	+ x	+ 1
Auto Titles[3]:					
New Cars	No.	n.a.	n.a.	n.a.	n.a.
New Trucks	"	n.a.	n.a.	n.a.	n.a.
Retail Food Prices[15]	1967	b	b	b	b
Bank Debits[5]	1967f	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967f	130	140	— 15	— 8
Value of Bldg. Const.[9]:					
Total	"	121	161	— 55	— 34
Residential	"	162	138	— 43	— 30
Nonresidential	"	79	184	— 69	— 38
Steel Production[18]	1967g	b	b	b	b
Labor Force Estimates[11]:					
Civilian Labor Force	Thous.	241.5	237.0	+ 1	— x
Civilian Employment	"	222.6	220.2	— 2	— 1
Unemp. Total—No.	"	19.5	16.8	+ 48	+ 16
Unemp., Total—Rate	%	8.1	7.1		
CANTON				%	%
Number Employed[7]:					
Total[w]	1967	92	95	— 6	— 4
Manufacturing	"	83	87	— 9	— 7
Trade, Serv., & Utils.	"	109	109	— 2	+ x
Construction	"	75	77	— 8	— 9
Payrolls[7]:					
Total[w]	"	228	236	— 4	+ 1
• Manufacturing	"	202	210	— 7	— 3
Trade, Serv., & Utils.	"	302	308	+ 1	+ 5
Construction	"	172	184	— 5	+ 8
Emp. Earn.—Gross Wkly.[7]:					
All Industries[w]	$	318.75	321.63	+ 1	+ 3
Manufacturing	"	351.71	352.69	+ 1	+ 2
Trade, Serv., & Utils.	"	252.24	256.46	+ 1	+ 4
Construction	"	432.87	450.14	— 5	+ 8
Retail Sales[2]	%	c	c	— 2	+ 1
Auto Titles[3]:					
New Cars	No.	n.a.	n.a.	n.a.	n.a.
New Trucks	"	n.a.	n.a.	n.a.	n.a.
Retail Food Prices[15]	1967	b	b	b	b
Bank Debits[5]	1967f	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967f	b	b	b	b
Value of Bldg. Const.[9]:					
Total	"	230	182	+ 4	— 13
Residential	"	78	197	— 77	— 40
Nonresidential	"	416	163	+458	+ 21
Steel Production[18]	1967g	b	b	b	b
Labor Force Estimates[11]:					
Civilian Labor Force	Thous.	173.4	170.6	+ 3	+ 2
Civilian Employment	"	159.0	158.2	— 1	+ x
Unemp. Total—No.	"	14.4	12.4	+ 82	+ 26
Unemp., Total—Rate	%	8.3	7.3		
CINCINNATI				%	%
Number Employed[7]:					
Total[w]	1967	87	86	— 9	— 7
Manufacturing	"	62	64	— 18	— 17
Trade, Serv., & Utils.	"	113	109	— 2	+ 2
Construction	"	67	69	— 26	— 12
Payrolls[7]:					
Total[w]	"	214	215	— 8	— 6
• Manufacturing	"	151	156	— 18	— 18
Trade, Serv., & Utils.	"	301	297	+ 2	+ 5
Construction	"	172	174	— 27	— 5
Emp. Earn.—Gross Wkly.[7]:					
All Industries[w]	$	284.21	289.61	+ 2	+ 2
Manufacturing	"	334.50	335.22	+ 2	+ 1
Trade, Serv., & Utils.	"	216.91	227.98	+ 2	+ 1
Construction	"	450.72	446.24	— 1	+ 8
Retail Sales[2]	%	c	c	+ 2	+ 2
Auto Titles[3]:					
New Cars	No.	3,690	4,221	— 39	— 20
New Trucks	"	562	636	— 40	— 40
Retail Food Prices[15]	1967	265	262	+ 6	+ 6
Bank Debits[5]	1967f	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967f	b	b	b	b
Value of Bldg. Const.[9]:					
Total	"	198	71	+ 45	— 30
Residential	"	214	44	+ x	— 46
Nonresidential	"	182	95	+177	— 16
Steel Production[18]	1967g	94	107	— 20	— 10
Labor Force Estimates[11]:					
Civilian Labor Force	Thous.	421.3	416.6	— 1	— 2
Civilian Employment	"	392.2	390.4	— 4	— 3
Unemp. Total—No.	"	29.1	26.2	+ 52	+ 9
Unemp., Total—Rate	%	6.9	6.3		
CLEVELAND				%	%
Number Employed[7]:					
Total[w]	1967	84	86	— 10	— 6
Manufacturing	"	60	66	— 23	— 14
Trade, Serv., & Utils.	"	109	108	— x	+ x
Construction	"	64	69	— 15	— 4
Payrolls[7]:					
Total[w]	"	186	197	— 12	— 4
• Manufacturing	"	125	143	— 30	— 18
Trade, Serv., & Utils.	"	268	271	+ 5	+ 8
Construction	"	173	179	— 13	+ 5
Emp. Earn.—Gross Wkly.[7]:					
All Industries[w]	$	344.78	354.54	— 1	+ 2
Manufacturing	"	359.07	374.90	— 7	— 3
Trade, Serv., & Utils.	"	315.13	321.92	+ 6	+ 8
Construction	"	493.28	472.30	+ 2	+ 9
Retail Sales[2]	%	c	c	— 6	— 4
Auto Titles[3]:					
New Cars	No.	6,046	6,748	— 44	— 25
New Trucks	"	661	671	— 37	— 36
Retail Food Prices[15]	1967	249	250	+ 3	+ 5
Bank Debits[5]	1967f	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967f	b	b	b	b
Value of Bldg. Const.[9]:					
Total	"	38	87	— 71	— 1
Residential	"	39	45	— 72	— 40
Nonresidential	"	37	125	— 70	+ 25
Steel Production[18]	1967g	106	124	— 26	— 11
Labor Force Estimates[11]:					
Civilian Labor Force	Thous.	734.5	727.4	— 1	— 2
Civilian Employment	"	678.3	682.1	— 5	— 3
Unemp. Total—No.	"	56.2	45.3	+ 71	+ 19
Unemp., Total—Rate	%	7.7	6.2		
COLUMBUS				%	%
Number Employed[7]:					
Total[w]	1967	97	98	— 8	— 4
Manufacturing	"	59	63	— 20	— 12
Trade, Serv., & Utils.	"	123	123	— 3	— 2
Construction	"	67	68	— 9	+ 7
Payrolls[7]:					
Total[w]	"	229	231	— 3	+ 2
• Manufacturing	"	127	135	— 20	— 10
Trade, Serv., & Utils.	"	325	324	+ 4	+ 6
Construction	"	167	159	+ 1	+ 20
Emp. Earn.—Gross Wkly.[7]:					
All Industries[w]	$	282.06	280.62	+ 5	+ 7
Manufacturing	"	335.33	336.41	+ 2	+ 5
Trade, Serv., & Utils.	"	235.03	234.04	+ 7	+ 7
Construction	"	398.40	380.35	+ 7	+ 12
Retail Sales[2]	%	e	e	— 11	— 4
Auto Titles[3]:					
New Cars	No.	3,551	4,062	— 38	— 19
New Trucks	"	758	877	— 30	— 23
Retail Food Prices[15]	1967	b	b	b	b
Bank Debits[5]	1967f	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967f	b	b	b	b
Value of Bldg. Const.[9]:					
Total	"	114	99	— 75	— 34
Residential	"	120	146	— 54	— 33
Nonresidential	"	108	52	— 83	— 34
Steel Production[18]	1967g	b	b	b	b
Labor Force Estimates[11]:					
Civilian Labor Force	Thous.	429.8	423.4	— x	— 1
Civilian Employment	"	405.7	403.4	— 2	— 1
Unemp. Total—No.	"	24.2	20.0	+ 32	— 7
Unemp., Total—Rate	%	5.6	4.7		
DAYTON				%	%
Number Employed[7]:					
Total[w]	1967	99	104	— 8	— 3
Manufacturing	"	58	66	— 21	— 11
Trade, Serv., & Utils.	"	160	160	+ x	+ 2
Construction	"	89	84	— 8	+ 1
Payrolls[7]:					
Total[w]	"	194	206	— 11	— x
• Manufacturing	"	123	143	— 27	— 9
Trade, Serv., & Utils.	"	346	346	+ 8	+ 9
Construction	"	215	203	— 8	+ 11
Emp. Earn.—Gross Wkly.[7]:					
All Industries[w]	$	344.98	349.51	— 3	+ 3
Manufacturing	"	372.12	380.43	— 9	+ 1
Trade, Serv., & Utils.	"	295.10	294.88	+ 8	+ 7
Construction	"	433.75	432.73	— x	+ 10
Retail Sales[2]	%	c	c	— 3	— 2
Auto Titles[3]:					
New Cars	No.	2,013	2,540	— 42	— 20
New Trucks	"	275	319	— 52	— 53
Retail Food Prices[15]	1967	b	b	b	b
Bank Debits[5]	1967f	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967f	b	b	b	b
Value of Bldg. Const.[9]:					
Total	"	107	198	— 48	+ 19
Residential	"	48	166	— 79	— 52
Nonresidential	"	180	238	— x	+ 90
Steel Production[18]	1967g	b	b	b	b
Labor Force Estimates[11]:					
Civilian Labor Force	Thous.	269.2	266.3	— 1	— 1
Civilian Employment	"	246.3	247.3	— 3	— 2
Unemp. Total—No.	"	22.9	19.1	+ 36	+ 18
Unemp., Total—Rate	%	8.5	7.2		
TOLEDO				%	%
Number Employed[7]:					
Total[w]	1967	86	91	— 18	— 11
Manufacturing	"	49	61	— 46	— 30
Trade, Serv., & Utils.	"	121	121	+ x	+ 1
Construction	"	83	73	+ 1	+ 13
Payrolls[7]:					
Total[w]	"	204	217	— 15	— 9
• Manufacturing	"	110	135	— 44	— 31
Trade, Serv., & Utils.	"	331	336	+ 8	+ 9
Construction	"	207	171	+ 2	+ 20
Emp. Earn.—Gross Wkly.[7]:					
All Industries[w]	$	344.23	343.09	+ 8	+ 6
Manufacturing	"	382.08	377.16	+ 5	+ 1
Trade, Serv., & Utils.	"	292.42	297.88	+ 14	+ 12
Construction	"	486.23	458.77	— 1	+ 5
Retail Sales[2]	%	c	c	— 6	— 4
Auto Titles[3]:					
New Cars	No.	n.a.	n.a.	n.a.	n.a.
New Trucks	"	n.a.	n.a.	n.a.	n.a.
Retail Food Prices[15]	1967	b	b	b	b
Bank Debits[5]	1967f	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967f	128	135	— 20	— 12
Value of Bldg. Const.[9]:					
Total	"	76	156	— 58	— 38
Residential	"	180	185	— 33	— 46
Nonresidential	"	21	140	— 84	— 29
Steel Production[18]	1967g	b	b	b	b
Labor Force Estimates[11]:					
Civilian Labor Force	Thous.	221.0	218.8	— x	— 2
Civilian Employment	"	195.3	195.8	— 7	— 3
Unemp. Total—No.	"	25.7	23.0	+106	+ 40
Unemp., Total—Rate	%	11.6	10.5		
YOUNGSTOWN				%	%
Number Employed[7]:					
Total[w]	1967	80	81	— 5	— 5
Manufacturing	"	49	51	— 14	— 12
Trade, Serv., & Utils.	"	119	120	— 2	— x
Construction	"	52	50	+ 23	— 2
Payrolls[7]:					
Total[w]	"	184	185	+ 3	+ 1
• Manufacturing	"	126	131	— 7	— 7
Trade, Serv., & Utils.	"	300	296	+ 9	+ 9
Construction	"	139	132	+ 36	+ 3
Emp. Earn.—Gross Wkly.[7]:					
All Industries[w]	$	321.05	317.61	+ 8	+ 6
Manufacturing	"	365.45	362.69	+ 7	+ 4
Trade, Serv., & Utils.	"	249.30	244.55	+ 11	+ 9
Construction	"	457.54	457.75	+ 5	+ 2
Retail Sales[2]	%	c	c	— 9	— 4
Auto Titles[3]:					
New Cars	No.	987	1,181	— 44	— 27
New Trucks	"	111	283	— 68	— 34
Retail Food Prices[15]	1967	b	b	b	b
Bank Debits[5]	1967f	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967f	71	75	— 20	— 13
Value of Bldg. Const.[9]:					
Total	"	114	208	— 59	— 27
Residential	"	74	207	— 72	— 56
Nonresidential	"	162	208	— 45	+ 8
Steel Production[18]	1967g	54	71	— 41	— 25
Labor Force Estimates[11]:					
Civilian Labor Force	Thous.	129.3	128.8	— 1	— 2
Civilian Employment	"	114.1	115.7	— 7	— 4
Unemp. Total—No.	"	15.2	13.0	+ 87	+ 31
Unemp., Total—Rate	%	11.7	10.1		

NOTE: All data are for county areas except bank debits and commercial failures, which are for areas within city limits. The indexes of number employed and payrolls and the employee weekly earnings are based on data for production workers in manufacturing, construction workers in contract construction, and nonsupervisory employees in other categories which exclude agriculture, government, education, and public institutions.

• Indicates series charted (page S-3). For sources and footnotes, see page S-3.

Number Employed, Payrolls, and Man-Hours in Ohio Industry

INDUSTRIAL GROUP	NUMBER EMPLOYED[7]					PAYROLLS[7]					MAN-HOURS[7]				
	INDEX (1967 = 100)		CHANGE			INDEX (1967 = 100)		CHANGE			INDEX (1967 = 100)		CHANGE		
	May 1980 (p)	Apr. 1980 (r)	May 1980 from Apr. 1980	May 1980 from May 1979	5 months 1980 from 1979	May 1980 (r)	Apr. 1980 (p)	May 1980 from Apr. 1980	May 1980 from May 1979	5 months 1980 from 1979	May 1980 (p)	Apr. 1980 (r)	May 1980 from Apr. 1980	May 1980 from May 1979	5 months 1980 from 1979
			%	%	%			%	%	%			%	%	%
Total[w] (2,350)[a]	**83**	**85**	**— 2**	**— 9**	**— 6**	**187**	**193**	**— 3**	**— 6**	**— 1**	**79**	**81**	**— 3**	**— 11**	**— 7**
All Manufacturing[w] (1,276)	**68**	**72**	**— 5**	**— 17**	**— 11**	**157**	**168**	**— 7**	**— 15**	**— 9**	**62**	**66**	**— 7**	**— 20**	**— 14**
Chemicals (67)	96	97	— 1	— 1	— 8	211	208	+ 1	+ 1	— 11	89	89	— x	— 5	— 13
Food Products (87)	78	77	+ 2	+ 2	— 2	194	188	+ 3	+ 12	+ 8	69	67	+ 3	+ 2	— 2
Bakery	76	70	+ 8	— 1	— 1	188	168	+ 12	+ 12	+ 9	74	66	+ 12	+ 2	+ x
Miscellaneous	78	77	+ 1	+ 3	— 2	194	190	+ 2	+ 12	+ 8	67	66	+ 1	+ 2	— 2
Lumber Products (43)	84	89	— 6	— 16	— 13	176	189	— 7	— 6	— 2	74	82	— 9	— 16	— 12
Furniture	94	99	— 6	— 15	— 13	195	212	— 8	— 4	— 1	87	97	— 11	— 15	— 11
Miscellaneous	67	71	— 5	— 20	— 14	147	151	— 3	— 10	— 6	56	59	— 4	— 19	— 14
Machinery (295)	67	71	— 5	— 12	— 5	150	157	— 5	— 6	+ 2	63	67	— 5	— 14	— 6
Elec. Mach., Apparatus and Supplies	73	77	— 5	— 12	— 4	170	179	— 5	— 7	+ 4	68	72	— 5	— 14	— 4
Machine Tools	62	65	— 5	— 2	+ x	143	149	— 4	+ 5	+ 10	62	66	— 6	— 3	+ x
Agricultural Equipment	32	37	— 14	— 39	— 19	76	89	— 15	— 37	— 10	35	41	— 14	— 44	— 20
Special Machinery and Appliances	64	67	— 4	— 13	— 8	133	139	— 4	— 8	— 2	59	62	— 5	— 16	— 10
Metal Products (348)	72	81	— 11	— 20	— 12	164	192	— 14	— 20	— 10	62	73	— 14	— 25	— 16
Foundry Products and Drop Forgings	67	92	— 27	— 37	— 18	152	230	— 34	— 40	— 21	52	74	— 30	— 42	— 23
Pipes, Valves, and Plumbers' Supplies	48	69	— 30	— 46	— 21	115	183	— 37	— 41	— 15	51	77	— 35	— 44	— 22
Screw Machine Products and Hdwe.	75	88	— 15	— 25	— 13	135	162	— 16	— 29	— 14	68	82	— 16	— 33	— 19
Sheet Metal Work	77	80	— 4	— 23	— 19	169	182	— 7	— 25	— 16	63	67	— 6	— 28	— 20
Steel Works and Rolling Mills	75	77	— 3	— 7	— 5	167	184	— 9	— 6	— 3	65	72	— 10	— 14	— 11
Stoves and Furnaces	65	76	— 15	— 42	— 28	131	156	— 16	— 40	— 21	68	79	— 15	— 42	— 27
Miscellaneous	68	78	— 13	— 22	— 12	155	181	— 14	— 20	— 7	58	67	— 14	— 24	— 13
Paper and Printing (135)	61	62	— 2	— 7	— 5	154	162	— 5	— 3	+ 1	56	58	— 4	— 11	— 8
Paper and Pulp	44	43	+ 2	— 8	— 3	147	163	— 10	— 2	+ 6	37	38	— 4	— 11	— 4
Printing and Publishing	74	75	— 1	— 6	— 5	170	170	— x	— 2	— 1	68	68	— 1	— 7	— 6
Miscellaneous	61	64	— 4	— 8	— 6	146	153	— 5	— 3	+ x	59	62	— 5	— 12	— 9
Rubber Products (52)	56	61	— 8	— 22	— 15	132	148	— 10	— 25	— 14	49	55	— 11	— 28	— 19
Tires and Tubes	47	47	— 1	— 11	— 9	101	103	— 2	— 10	— 9	33	35	— 3	— 17	— 15
Miscellaneous	61	69	— 12	— 27	— 17	154	181	— 15	— 33	— 16	61	71	— 14	— 33	— 21
Stone, Clay, and Glass Products (93)	69	72	— 3	— 8	— 5	177	178	— 1	— 1	+ x	75	77	— 2	— 9	— 7
Brick and Tile	51	52	— 1	— 16	— 13	106	109	— 3	— 12	— 8	51	52	— 3	— 17	— 15
Glass	76	77	— 2	— 5	— 4	178	178	+ x	+ 1	+ 1	77	77	— x	— 4	— 4
Vitreous & Semi-Vit. China & Pottery	51	53	— 5	— 11	— 4	158	163	— 3	+ 2	+ 7	78	81	— 4	— 12	— 4
Miscellaneous	79	83	— 4	— 10	— 5	209	207	+ 1	— 7	— 2	80	83	— 3	— 16	— 10
Textiles (37)	69	69	— x	— 11	— 8	102	106	— 4	— 11	— 6	64	67	— 4	— 16	— 11
Men's Clothing	82	82	— 1	— 4	— 4	110	114	— 3	— 3	— 5	72	74	— 4	— 10	— 11
Miscellaneous	61	61	+ 1	— 15	— 11	99	103	— 4	— 17	— 7	60	62	— 4	— 20	— 11
Vehicles (62)	56	57	— 3	— 41	— 33	135	140	— 4	— 44	— 36	48	50	— 4	— 46	— 38
Autos and Parts	56	58	— 3	— 48	— 39	141	148	— 5	— 51	— 43	48	50	— 4	— 53	— 45
Cars, Electric and Steam Railway	95	99	— 4	— 9	— 5	223	221	+ 1	— 3	— 1	86	86	+ x	— 12	— 8
Miscellaneous	60	61	— 2	+ 20	+ 23	138	140	— 2	+ 33	+ 36	59	60	— 3	+ 17	+ 21
Miscellaneous Manufacturing (57)	59	62	— 4	— 12	— 8	137	144	— 5	— x	+ 4	55	59	— 6	— 12	— 7
Total Trade, Service, and Utilities[w] (702)	**102**	**102**	**+ x**	**— 2**	**— x**	**238**	**237**	**+ x**	**+ 5**	**+ 7**	**104**	**104**	**+ x**	**— 2**	**— x**
Service (209)	126	125	+ 1	+ 2	+ 3	265	263	+ 1	+ 10	+ 11	137	136	+ 1	+ 3	+ 4
Trade, Retail and Wholesale (385)	87	87	— x	— 5	— 3	203	202	+ 1	+ 1	+ 3	86	86	+ x	— 5	— 3
Transportation & Public Utilities (108)	108	108	+ x	— x	+ 1	296	297	— x	+ 7	+ 9	106	107	— x	— 2	— x
Construction (344)	**65**	**63**	**+ 3**	**— 11**	**— 1**	**169**	**160**	**+ 6**	**— 5**	**+ 12**	**59**	**58**	**+ 3**	**— 12**	**+ 4**
Mines and Quarries (28)	**127**	**121**	**+ 6**	**+ x**	**— 2**	**291**	**290**	**+ x**	**+ 10**	**+ 9**	**79**	**77**	**+ 1**	**+ x**	**— 1**

Indexes of number employed and of payrolls are based on the employment of 457,933 persons (production workers in manufacturing and mining, construction workers in contract construction, and nonsupervisory employees in other categories) in 2,350 firms; indexes of man-hours, on the employment of 443,307 production workers and nonsupervisory employees in 2,246 firms. Figures in parentheses show number of firms reporting employment and payrolls. In some cases fewer firms report man-hours. Data do not include agriculture, government, education, or public institutions. For sources and footnotes, see below.

FOOTNOTES FOR BULLETIN TABLES AND CHARTS

[f]Change in number of failures; [a]Figures in parentheses show number of firms reporting this month; [n.a.]Current data not available; [b]Comparable data not available; [c]Only percentage of change available; [d]Adjusted for seasonal change; [f]Adjusted for number of working days; [4]Four weeks average; [h]Annual rate; [p]Preliminary; [r]Revised; [s]Series revised; [w]Weighted; [x]Less than 0.5 percent; [y]More than 1,000 percent increase.

Primary Sources:

Computed from: [1]Center for Business and Economic Research multiple regression model.

Computed from original data collected by the Center for Business and Economic Research from: [2]Ohio retailers; [3]County Clerks of Courts; [4]Local Power and Light Companies.

Computed by the Center for Business and Economic Research from data supplied by: [5]Board of Governors of the Federal Reserve System; [6]Life Insurance Marketing and Research Association; [7]Division of Research and Statistics of the Ohio Bureau of Employment Services, collected in cooperation with the Bureau of Labor Statistics, U.S. Department of Labor; [8]Federal Power Commission; [9]F. W. Dodge Division, McGraw-Hill Information Systems Company; [10]Dun & Bradstreet, Inc.

Other data sources: [11]Federal Reserve Board; [12]Dun & Bradstreet, Inc.; [13]U.S. Department of Commerce; [14]Division of Research and Statistics of the Ohio Bureau of Employment Services; [15]U.S. Department of Labor; [16]Department of Agricultural Economics, O.S.U.; [17]U.S. Department of Agriculture; [18]American Iron and Steel Institute; [19]U.S. Department of Energy; [20]National Machine Tool Builders' Association; [21]F. W. Dodge Division, McGraw-Hill Information Systems Company; [22]R. L. Polk & Co.; [23]Standard & Poor's Corporation.

Note: In the Ohio-U.S. table, page S-2, dual source notes on a single line of the table stub refer first to Ohio data, second to U.S. data.

Ohio Retail Sales Trends

May Sales of Ohio Retailers were up 4 percent from April sales, but on a seasonally adjusted basis the May sales index showed a 1 percent decline from the April index. Compared with sales in year-ago May, sales in the current month were down 3 percent.

For the First Five Months of 1980, cumulative sales were only 1 percent higher than sales during the first 5 months of 1979.

By Kind of Business, current declines from last year again were dominated by the drops in sales by motor vehicle dealers—down 33 percent from May 1979 and down 20 percent from the 5-month period in 1979. To illustrate the effect of the drop-off in car sales, motor vehicle sales were factored out of the total sales index for the first 5 months of 1980 and the first 5 months of 1979. The resulting comparison of "total sales *excluding* motor vehicles" in May 1980 and May 1979 provides a percent increase of 4 percent—as contrasted with the 3 percent decline in total sales *including* motor vehicles—and for the first 5 months of 1980 and 1979 yields a 6 percent increase in the current year-to-date—compared to the 1 percent year-to-date increase in the total with vehicles included.

BULLETIN OF BUSINESS RESEARCH

Published Monthly at The Ohio State University
Columbus, Ohio

ELZY V. MCCOLLOUGH, *Editor*
MARTHA N. STRATTON, *Associate Editor*

Copyright, 1980, by The Ohio State University

Subscription Rates: $4.00 for 1 year; $7.00 for 2 years

INDEXES OF OHIO RETAIL SALES

KIND OF BUSINESS	INDEX (1957-59 = 100)		CHANGE			
			May 1980 from Apr. 1980		May 1980 from May 1979	5 months 1980 from 1979
	May 1980 (p)	Apr. 1980 (r)	Not Seas. Adj.	Seas. Adj.		
			%	%	%	%
Total Retail Stores[2, *]	**297**	**285**	**+ 4**	**— 1**	**— 3**	**+ 1**
Grocery Stores	346	322	+ 8	+ 5	+12	+11
Other Food Stores	414	340	+22	+17	+14	+14
General Stores (With Food)	184	188	— 2	— 9	+13	+31
Department Stores	241	246	— 2	— 5	+ 6	+ 4
Other General Merchandise	275	233	+18	+11	+20	+16
Men's Clothin-Furns. Strs.	123	111	+11	+ 2	+ 8	+ 2
Family Clothing Stores	155	160	— 3	— 5	+ 5	+10
Women's Ready-to-Wear Strs.	135	117	+16	+18	+15	— x
Shoe Stores	108	109	— 1	— 4	+ 4	+ x
Furniture Stores	211	203	+ 4	— 7	— 8	+ 1
Household Appl.-TV-Rdio Strs.	165	153	+ 8	— x	—11	— 2
Home Furnishings Stores	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Motor Vehicle Dealers	291	298	— 3	— 5	—33	—20
Other Automotive	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Filling Stations	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Lumber-Bldg. Matls. Dealers	244	231	+ 6	— 8	—24	—11
Paint, Glass & Wallpaper Strs.	208	206	+ 1	—11	+ 3	+17
Heat.-Plumb. & Elec. Sup. Strs.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Hardware Stores	287	257	+11	— 1	+ 3	+ 3
Farm Equipment Dealers	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Eating & Drinking Places	220	202	+ 9	+ 4	+ 1	+ 2
Drug Stores	299	344	—13	—16	+16	+17
Jewelry Stores	181	145	+25	— x	— 2	+ 8
Florists	285	238	+20	— 1	— x	— 3
Fuel Dealers	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Hay-Feed, Farm & Grdn. Strs.	736	736	+ x	— 2	+17	+11
State Liquor Stores	178	154	+15	+13	+ 9	+ 6

For sources and footnotes, see page S-3.

OSU

The Ohio State University

Center for Business and Economic Research
1775 College Road
Columbus, Ohio 43210

Non-Profit Org.
U. S. Postage
PAID
Columbus, Ohio
Permit No. 711

CONGRESSIONAL INFORMATION SERV
SRI-ACQUISITIONS
7101 WISCONSIN AVE
WASHINGTON DC 20014

BULLETIN OF BUSINESS RESEARCH

CENTER FOR BUSINESS AND ECONOMIC RESEARCH

THE OHIO STATE UNIVERSITY • VOLUME LV, NUMBER 8 • AUGUST 1980

By ROBERT R. EBERT

Chrysler, Automotive Scale Economies, and the Ohio Economy

The article presented here hypothesizes that the survival of Chrysler Corporation as an important component of the Ohio economy is dependent on its ability to exploit both plant-specific scale economies (i.e., satisfactory annual rates of production) and product-specific scale economies (i.e., satisfactory volumes of output for each of its models to minimize model changeover costs).

No attempt is made to explain the details of Chrysler's financial arrangements or the $1.5 billion in Federal Government guaranteed loans. There are other sources for that information.[1]

Before authorizing the granting of the loan guarantees federal officials stated that Chrysler's survival strategy could be disrupted if the automobile industry slump continues. The risks of failure still are considered significant.[2] Therefore, in addition to discussing implications of and conditions necessary for Chrysler's survival, the potential impact of its failure on the Ohio economy must be considered.

Chrysler in Ohio

Chrysler is a major component of the motor vehicle and equipment industry in Ohio (Standard Industrial Classification code, S.I.C., 371). (See Tables 1 and 2.) In 1979, the firm employed an average of 9,406 people in its manufacturing plants. In 1977, Chrysler accounted for

TABLE 1
CHRYSLER AND OHIO MANUFACTURING EMPLOYMENT DATA

	Employees				Establishments			
	Chrysler			Ohio Total	Chrysler			Ohio
Category	1979	1978	1977	1977	1979	1978	1977	1977
All Manufacturing (No.)	9,406	11,195	11,343	1,342,783	7	7	7	16,322
Motor Vehicle and Equipment Manufacturing (S.I.C. 371)	9,406	11,195	11,343	121,909	7	7	7	263
Payrolls: (Million $)				246	302		281	2,451
Suppliers in Ohio (No.)	....	....	....	....	n.a.	2,451	2,343	..
Supplier Employment (No.)—est.	n.a.	40,467	32,000	....	....	....	....	....
Purchases from Suppliers (Million $)	....	....	....	....	n.a.	1,362	1,089	..
Automotive Dealerships—(S.I.C. 551) (No.)	n.a.	10,036	6,191	37,439	n.a.	260	262	873

n.a. Not available.

Sources: U.S. Congress, House, Subcommittee on Economic Stabilization of the Committee on Banking, Finance, and Urban Affairs, *Findings of the Chrysler Corporation Loan Guarantee Board*, 96th Congress, 2d. Session, Committee Print 96-13, May 12, 1980, pp. 148-149.

Chrysler Corporation, "Chrysler Facilities in Ohio, 1977, 1978, 1979," News Relations Department (Mimeographed).

U.S. Department of Commerce, Bureau of the Census, *County Business Patterns, Ohio CBP-77-37* (Washington, D.C.: U.S. Government Printing Office, July, 1979).

(Continued on page 2)

Also In This Issue

Statistical Summary ..... *pages* S-1 *through* S-4
Business Conditions in Ohio and the United States ..... *page* S-1
Business Conditions in the 8 Largest Ohio Cities ..... *page* S-2
Number Employed, Payrolls, and Man-Hours in Ohio Industry ..... *page* S-3
Ohio Retail Sales Trends ..... *page* S-4

Chrysler and the Ohio Economy (Continued from page 1)

about 9 percent of S.I.C. employment in Ohio. In addition, Chrysler dealers employ about 10,000 persons and its suppliers another 40,000 in Ohio.

TABLE 2
CHRYSLER MANUFACTURING FACILITIES IN OHIO

City	County[a]	Type of Facility	Chrysler Employment May 1979
Dayton	Montgomery	Heaters and Air Conditioners	1,926
Fostoria (Closed in April 1980)	Hancock, Seneca, Wood	Foundry	652
Sandusky	Erie	Vinyl Products	344
Toledo	Lucas	Machining on Power Train Components	2,389
Twinsburg (Akron)	Summit	Stamping	3,748
Lima	Allen	Military Tanks	347
Van Wert	Van Wert	Powdered Metal, Magnet and Cold Extrusion Products	n.a.
		Total Ohio	9,406

[a] County is location of the major city of the area where the plant is located.

Source: U.S. Congress, House, Subcommittee on Economic Stabilization of the Committee on Banking, Finance, and Urban Affairs, *Findings of the Chrysler Corporation Loan Guarantee Board*, 96th Congress, 2d. Session, Committee Print 96-13, May 12, 1980, p. 148.

The localized impact of Chrysler operations on communities in Ohio is particularly important. Table 3 contains data on Chrysler employment as a percentage of both area labor force (Standard Metropolitan Statistical Area where applicable) and area manufacturing employment. In both categories a relatively large amount of local employment is accounted for by Chrysler facilities.

TABLE 3
CHRYSLER EMPLOYMENT IN OHIO: PERCENT OF LABOR FORCE, MAY 1979

Facility	Chrysler Employment	Area Labor Force	Chrysler Percent of Area Labor Force	Area Mfg. Employment	Chrysler as Percent of Area Mfg. Employment
		(Thousands)		(Thousands)	
Dayton	1,926	386.9	0.5%	109.9	1.8%
Fostoria	652	107.6	0.6	n.a.	....
Sandusky	344	39.7	0.9	n.a.	..
Toledo	2,389	367.4	0.7	91.5	2.6
Twinsburg	3,748	299.9	1.2	273.0	1.4
Lima	347	102.0	0.3	n.a.	....
Van Wert	n.a.	n.a.	n.a.	n.a.	....

n.a. Not available.

Source: U.S. Congress, House, Subcommittee on Economic Stabilization of the Committee on Banking, Finance, and Urban Affairs, *Findings of the Chrysler Corporation Loan Guarantee Board*, 96th Congress, 2d. Session, Committee Print 96-13, May 12, 1980, p. 148.

Table 4 describes recent reductions in Chrysler motor vehicle output and employment. Since January 1980, output and employment levels have fallen still further at Chrysler to a level of about 50 percent of potential. In addition, with a "rule-of-thumb" multiplier of about two on employment, for each Chrysler job lost directly there is a loss of one additional job through indirect effects on suppliers.[3]

TABLE 4
CHRYSLER EMPLOYMENT IN OHIO: CHANGES AS A RESULT OF AUTO INDUSTRY RECESSION

Facility	Chrysler Employment[a] May 1979	Sept. 1979	Jan. 1980	May-Jan. Changes
Dayton	1,926	1,491	1,207	— 719
Fostoria	652	505	371	— 281
Sandusky	344	232	250	— 94
Toledo	2,389	1,870	1,396	— 993
Twinsburg	3,748	3,532	2,777	— 971
Lima	347	320	278	— 69
Van Wert	n.a.	n.a.	n.a.	n.a.
Total	9,406	7,950	6,279	—3,127
(Note: Chrysler Car & Truck Production:)[b]	155,766	85,891	107,323	....

[a] U.S. Congress, House, Subcommittee on Economic Stabilization of the Committee on Banking, Finance, and Urban Affairs, *Findings of the Chrysler Corporation Loan Guarantee Board*, 96th Congress, 2d. Session, Committee Print 96-13, May 12, 1980, p. 148.

[b] *Automotive News, Market Data Book*, 1979 (Detroit: Crain Publications, April 30, 1980), pp. 24 and 45, and "U.S. Car and Truck Production," *Automotive News*, February 11, 1980, p. 192.

Urban areas such as Toledo, Dayton, and Akron/Cleveland where Chrysler has major production facilities would have particular unemployment problems in the event of a complete Chrysler shutdown. These problems might include reduced tax bases, increased social unrest, and racial tensions plus increased transfer payments to a larger pool of unemployed workers.

The only Chrysler manufacturing facility to be closed in Ohio thus far is the Fostoria foundry, closed in April 1980. At the time of its closing the plant employed 375 (300 hourly and 75 salaried personnel).[4] The Fostoria employment, therefore, had already dropped significantly from the May 1979 levels (see Table 4).

The impact of Chrysler plant closings would be dependent on two things: (1) how quickly laidoff workers would be absorbed into other firms and (2) the probability of Chrysler's closed facilities being purchased and operated by other businesses, especially automotive firms.

In the event of permanent closings some laidoff Chrysler workers would find employment in plants of other motor vehicle manufacturers or suppliers in Ohio. The extent to which such an absorption of workers would occur is dependent on the strength of the automobile market in future years. With 40,000 Ohio auto industry workers laidoff at mid-year 1980, a substantial improvement in the fortunes of the industry would be necessary to re-employ those workers. Therefore, rapid absorption of most laidoff Chrysler workers would not be likely.

The location of new domestic or foreign-owned motor vehicle manufacturing plants in Ohio would help unemployed Chrysler workers. The planned Honda automobile assembly plant in Marysville is an example of such a facility. However, the extent to which Chrysler workers would be helped by new plant locations would depend on their proximity to the closed Chrysler facilities. Furthermore, the construction of facilities takes considerable time. They would not be employing manufacturing workers for a period of about two years, thus dampening or postponing the favorable impact of any new plant location in Ohio.

Some of Chrysler's Ohio facilities could be purchased and used by other motor vehicle manufacturers (domestic or foreign). To the extent such purchases would occur, work disruptions would probably be for a maximum of two years.[5] The relative attractiveness of Chrysler's Ohio facilities to other buyers is discussed next.

The Toledo machining plant, constructed in 1966, is a modern facility. The plant could be useful to large automotive supply companies or suppliers of other large industrial concerns. The plant is one of those pledged as collateral against the Government guaranteed loans at a fair market value of $104.6 million. ("Fair market value" is defined as the amount which a user, other than Chrysler Corporation, who could adapt the facilities to its production with minimal alterations might be expected to pay for the facility.)[6]

The Twinsburg stamping plant is a modern facility constructed in 1957. The plant could be a cornerstone for a foreign automotive manufacturer seeking to locate in the U.S. Assembly plants can be established in general purpose plants. But, stamping plants must be built expressly for that purpose and require a very heavy commitment of funds. Thus, it is reasonable to assume the Twinsburg plant (also pledged as part of the loan guarantee collateral) could be disposed of within a reasonable time at approximately its fair market value of $179.7 million.[7]

The Sandusky and Van Wert plants are both relatively small but considered modern. They may be useful to manufacturers of vinyl products, and powdered metal, magnet, and cold extrusion products, respectively. It is reasonable to assume these plants could be sold at their fair market values of $14.4 million and $17 million, respectively.[8]

As already noted, the Fostoria plant has been closed. It is an old plant, originally built in 1912. It is unlikely it could be sold for more than its "orderly liquidation value" (i.e., the amount that might be realized from piecemeal sale of the property).[9]

The Lima plant is a leased facility in which Chrysler builds the XM1, turbine powered main battle tank.[10] In the event of a Chrysler shutdown, it is likely the U.S. Government would find another firm to operate the plant for production of tanks.

The Dayton plant is old, having been built in 1915, but has modern equipment. It is valued at an orderly liquidation value of $21.4 million. A number of automotive companies could use these facilities. However, given current economic conditions in the automobile industry, such a prospect is considered remote.[11]

Finally, the impact on dealers from a Chrysler shutdown must be considered. Some of the former Chrysler dealers might make arrangements with foreign producers. However, most major foreign producers selling vehicles in the U.S. already have extensive and well-established dealer organizations. Therefore, the probability of many of the 260 Chrysler dealers in Ohio surviving as viable new car automobile retailers is not great.

In general, then, it can be concluded that in the event of a Chrysler shutdown most of its Ohio facilities would, in time, find use as manufacturing plants. Some of the plants (especially the Toledo and Twinsburg plants) likely would remain automotive industry facilities. However, a two- to five-year period of adjustment with at least temporary but extensive layoffs in these plants would occur. In addition, the impact on employment in Chrysler dealerships and suppliers in Ohio would be significant. If the problems associated with such an adjustment are to be avoided, Chrysler must remain a viable motor vehicle producer.

Minimal Optimal Scale In Auto Production

To properly assess the prospects for Chrysler's survival and its impact on Ohio, it is necessary to examine the scale economy issue. It is not possible to review all of the literature on scale economies and industrial organization here. At best, what is attempted is a brief summary of the evolution and present status of the scale economy issue as it relates to the automobile industry.

First, some terminology must be explained. Minimal Optimal Scale (M.O.S.) is defined as that output at which unit material plus production costs first attain a minimum value.[12] Plant-specific scale economies are associated with the overall sizes of plants. Another type of scale economy exists; i.e., the product-specific economies associated with the length of production runs for individual products. The product-specific economies are typically due to gains in production know-how and operative skill associated with accumulating production volume.[13]

Both plant and product-specific scale economies, i.e., annual output rates and total volume of units of a given car model produced through time, are a critical issue in the automobile industry. Table 5 summarizes automobile and truck output market shares and profits for the U.S. from 1973 to 1979. The seven-year period shows a complete cycle in the motor vehicle industry with both 1973 and 1978 being peak years in motor vehicle production.

Insight on the production capacity of the industry and, consequently, on scale economies in automobile production may be gained by examining Table 6.[14]

Historically, output of around 200,000 units per year per assembly plant achieves M.O.S. The average per as-

(Continued on page 4)

Chrysler and the Ohio Economy (Continued from page 3)

TABLE 5
U.S. MOTOR VEHICLE MANUFACTURERS: PERCENTAGE OUTPUT SHARES, 1973-1979

	1973	1974	1975	1976	1977	1978	1979
				(Dollar amounts in millions)			
GENERAL MOTORS							
Cars	54.3	48.8	54.9	57.8	57.5	57.5	60.4
Trucks	41.8	39.6	42.3	43.7	40.5	39.7	42.8
$Profits	$2,398	$950	$1,253	$2,903	$3,338	$3,508	$2,893
FORD MOTOR COMPANY							
Cars	25.8	30.2	26.8	24.1	27.5	27.9	24.2
Trucks	31.5	32.6	30.8	30.1	34.5	37.2	34.7
$Profits	$907	$361	$323	$983	$1,678	$1,589	$1,169
CHRYSLER CORPORATION							
Cars	16.1	16.1	13.4	15.6	13.3	12.3	11.1
Trucks	12.6	13.0	14.1	15.0	13.8	12.5	10.2
$Profits (Loss)	$255	($52)	($260)	$423	$163	($205)	($1,097)
AMERICAN MOTORS							
Cars	3.7	4.8	4.8	2.5	1.7	1.8	2.2
Trucks	4.4	4.8	6.0	5.2	5.5	5.1	5.3
$Profits (Loss)	$86	$28	($28)	($46)	$6	$37	$84
VOLKSWAGEN							
Cars	.....	.....	.....	.....	.....	0.4	2.1
Trucks	.....	.....	.....	.....	.....	.....	0.1
$Profits (World-wide)	.....	.....	.....	.....	.....	189	240
TOTAL UNITS: (Thousands)	12,674	10,051	8,990	11,483	12,738	13,043	11,391
Cars	9,667	7,309	6,740	8,537	9,294	9,153	8,418
Trucks	3,007	2,742	2,250	2,946	3,444	3,890	2,973

Source: *Automotive News Market Data Books, 1974, 1975, 1976, 1977, 1978, 1979, 1980* (Detroit, Michigan: Crain Publications) and *1979 Financial Statements* (Wolfsburg, Federal Republic of Germany: Volkswagenwerkaktiengesellschaft, July 1980).

TABLE 6
U.S. AUTOMOBILE MANUFACTURERS
OUTPUT PER ASSEMBLY PLANT, 1977[a]

Company	Auto Output in U.S.[a]	Number of Assembly Plants in U.S.[b]	Average Number of Units per Assembly Plant
General Motors	5,339,685	22	242,713
Ford	2,555,866	14	182,562
Chrysler[c]	1,177,070	6	196,178
American Motors	156,984	1	156,984
Total	9,293,674	44	211,220

[a] *Automotive News, Market Data Book*, 1978 (Detroit: Crain Publications, 1978), p. 37.

[b] *Automotive News, Market Data Book*, 1977 (Detroit: Crain Publications, 1977), p. 38.

[c] Does not include production of two van models (Voyager and Sportsman) produced in a truck plant but registered as passenger cars (total output = 59,289 in 1977).

sembly plant in 1977 was 211,220. In the previous peak year of 1973 the average for 43 assembly plants was 224,817.

For an integrated automobile producer (one that produces major components such as bodies, engines, transmissions and assembles the parts into a completed vehicle), Joe Bain estimated output of 150,000 units would be necessary to be profitable with a single assembly plant.[15] Both Lawrence White and D. G. Rhys agree that M.O.S. can be achieved with approximately 200,000 units per year in an assembly plant operating on a two-shift basis.[16]

Rhys does make the important observation that new technology could lead to larger rates of output for M.O.S.[17] Indeed, the newer assembly line techniques in use in the U.S. by Chrysler and other firms suggest an increase in the M.O.S. level of auto assembly is occurring. This topic is discussed in detail later.

The apparent unanimity on M.O.S. estimates for auto assembly is not present among economists studying all stages of auto production. Bain estimated that reductions in average cost per unit could be obtained up to about 600,000 units per year.[18] White estimated M.O.S. in production (stampings) was achieved at a rate of 400,000 per year and in engine production at about 280,000 units per year. Therefore, he concluded that "a firm producing in the range of 400,000 cars a year would exhaust most of the production economies that exist."[19]

One qualification made by White was that a firm needs to diversify its risks and produce at least two lines of cars in order to have long-term success. Therefore, he concluded 800,000 cars a year split into two makes was necessary for survival.[20]

Rhys differed significantly from the estimates made by White. He found in machining operations the use of expensive equipment to manufacture one basic component or vehicle model requires high annual rates and total volumes of production to be cost justified. He estimated the M.O.S. in engine and transmission machining at nearly 1,000,000 units per year. In the production of auto bodies, Rhys concluded very large output is necessary to achieve efficient operations. He estimated the overall optimum level of annual output for an integrated auto producer at about 2,000,000 units per year.[21]

(Continued on page 5)

BULLETIN OF BUSINESS RESEARCH

STATISTICAL SUMMARY

Center for Business and Economic Research

The Ohio State University

Volume LV, Number 8 • August 1980

Business Conditions in Ohio and the United States

ITEM	Unit or Index Base Period	OHIO June 1980 (p)	OHIO May 1980 (r)	OHIO Change From Last Month: June 1980 from May 1980	OHIO Change From Last Year: June 1980 from June 1979	OHIO Change From Last Year: 6 months 1980 from 1979	UNITED STATES Unit or Index Base Period	UNITED STATES June 1980 (p)	UNITED STATES May 1980 (r)	UNITED STATES Change From Last Month: June 1980 from May 1980	UNITED STATES Change From Last Year: June 1980 from June 1979	UNITED STATES Change From Last Year: 6 months 1980 from 1979
GENERAL BUSINESS				%	%	%				%	%	%
• Bank Debits[9, 11]	*1967f*	n.a.	n.a.	n.a.	n.a.	n.a.	*Bil. $ Ex. NY[d, h]*	n.a.	n.a.	n.a.	n.a.	n.a.
Commercial Failures—Number[12]	*Number*	n.a.	n.a.	n.a.	n.a.	n.a.	*Number*	n.a.	n.a.	n.a.	n.a.	n.a.
Commercial Failures Liabilities[12]	*Thous. Dol.*	n.a.	n.a.	n.a.	n.a.	n.a.	*Thous. Dol.*	n.a.	n.a.	n.a.	n.a.	n.a.
Life Insurance Sales[6]	*1967*	332	345	— 4	+ 4	+ 10	*1967*	388	383	+ 1	+ 11	+ 12
INCOME												
• Total Personal Income[1, 13]	*Mil. Dol.[d, h]*	99,686	99,058	+ 1	+ 7	+ 8	*Bil. Dol.[d, h]*	2,086	2,078	+ x	+ 9	+ 10
Salaries & Wages Income[7, 13]	*Mil. Dol.[d, h]*	c	c	+ 2	— 3	— 2	*Bil. Dol.[d, h]*	1,310	1,309	+ x	+ 7	+ 9
Nonagricultural Income[13]		b	b	b	b	b	*Bil. Dol.[d, h]*	2,044	2,036	+ x	+ 10	+ 11
Employee Earn.—Gross Wkly.: Mfg.[14, 15]	*Dollars*	339.25	336.04	+ 1	+ 3	+ 4	*Dollars*	282.89	280.21	+ 1	+ 5	+ 6
" " " Const.[14, 15]	*Dollars*	471.86	449.07	+ 5	+ 8	+ 9	*Dollars*	370.06	360.14	+ 3	+ 7	+ 7
Agr. Income (Cash Mktgs.)[16, 17]	*1957–59*	n.a.	n.a.	n.a.	n.a.	n.a.	*1967*	n.a.	n.a.	n.a.	n.a.	n.a.
EMPLOYMENT & UNEMPLOYMENT												
Civilian Labor Force[14, 15]	*Thousands*	5,156	5,035	+ 2	+ 2	+ 1	*Thousands*	106,067	104,028	+ 2	+ 2	+ 2
Civilian Employment[14, 15]	*Thousands*	4,654	4,596	+ 1	— 2	— 2	*Thousands*	97,776	96,709	+ 1	— x	+ 1
Nonagricultural Employment[14, 15]	*Thousands*	4,451	4,433	+ x	— 2	— 1	*Thousands*	94,039	93,273	+ 1	— x	+ 1
Mfg. Prod. Employment[7, 15]	*1967*	68	68	— x	— 16	— 12	*1967*	98	99	— 1	— 8	— 4
• Mfg. Prod. Payrolls[7, 15]	*1967*	157	157	+ x	— 15	— 10	*1967*	243	242	+ x	— 3	+ 2
Average Weekly Hours—Mfgr. Prod.[7, 15]	*Number*	40.1	40.1	— x	— 4	— 3	*Number*	39.4	39.3	+ x	— 2	— 1
Unemployment, Total—No.[14, 15]	*Thousands*	503	439	+ 15	+ 72	+ 32	*Thousands*	8,291	7,318	+ 13	+ 33	+ 20
Unemployment, Total—Rate[14, 15]	*Percent*	9.7	8.7				*Percent*	7.8	7.0			
Unemployment, Insured[14, 15]	*Thousands*	235	212	+ 11	+163	+ 80	*Thousands*	3,779	3,680	+ 3	+ 79	+ 36
Registered for Work, O.B.E.S.[14]	*Thousands*	376	383	— 2	+ 13	+ 14		b	b	b	b	b
Unemployment Compensation Fund[11]	*Mil. Dol.*	224	325	— 31	— 58	— 29		b	b	b	b	b
PRODUCTION												
Gross National Product (Quarterly)[13]		b	b	b	b	b	*Bil. Dol.[d, h]*	2,523	2,521	+ x	+ 8	+ 9
Industrial Production[7, 11]	*1967*	c	c	— x	— 20	— 15	*1967[d]*	141	145	— 2	— 8	— 2
• Steel Production[18]	*Thous. Tons*	1,079	1,371	— 21	— 44	— 23	*Thous. Tons*	7,501	9,226	— 19	— 39	— 16
Electric Power Production[8]	*1967f*	n.a.	n.a.	n.a.	n.a.	n.a.	*Mil. KWH*	n.a.	n.a.	n.a.	n.a.	n.a.
Bituminous Coal Production[19]	*Thous. Tons*	4,149	4,320	— 4	+ 1	+ 4	*Thous. Tons*	n.a.	n.a.	n.a.	n.a.	n.a.
Pig Iron Production[18]	*Thous. Tons*	756	939	— 20	— 42	— 23	*Thous. Tons*	4,664	5,906	— 21	— 42	— 18
Machine Tools—Shipments[20]		b	b	b	b	b	*Mil. Dol.*	n.a.	373.75	n.a.	n.a.	n.a.
Machine Tools—New Orders[20]		b	b	b	b	b	*Mil. Dol.*	n.a.	453.40	n.a.	n.a.	n.a.
Durable Goods—New Orders[18]		b	b	b	b	b	*Mil. Dol.[d]*	66,626	67,328	— 1	— 12	— 5
CONSTRUCTION (Value of Contracts)												
• Total (Seas. Adj.)[9, 21]	*1967[d]*						*1967[d]*					
Total[9, 21]	*1967f*	164	147	+ 12	— 42	— 28	*Mil. Dol.*	12,426	11,135	+ 12	— 18	— 25
Residential Building[9, 21]	*1967f*	158	142	+ 11	— 46	— 45	*Mil. Dol.*	5,092	4,495	+ 13	— 30	— 31
Nonresidential Building[9, 21]	*1967f*	168	129	+ 30	— 41	— 14	*Mil. Dol.*	4,861	4,135	+ 18	+ 6	+ x
Utilities and Non-Building Const.[9, 21]	*1967f*	168	204	— 17	— 32	— 18	*Mil. Dol.*	2,471	2,505	— 1	— 24	— 41
DISTRIBUTION												
Total Retail Sales[2, 13]	*1957–59[d]*	271	288	— 6	— 6	+ x	*Mil. Dol.[d]*	75,345	74,265	+ 1	+ 5	+ 7
Department Store Sales[2, 13]	*1957–59[d]*	274	258	+ 6	— 3	+ 2	*Mil. Dol.[d]*	7,791	7,727	+ 1	+ 8	+ 9
• New Passenger Cars Registered[3, 22]	*1967*	87	83	+ 4	— 35	— 25	*No.–49 sts.*	675,964	733,229	— 8	— 23	— 15
New Trucks Registered[3, 22]	*No.–44 cos.*	4,140	3,741	+ 11	— 36	— 41	*No.–48 sts.*	210,673	206,868	+ 2	— 24	— 27
Used Cars Registered[3]	*No.–32 cos.*	30,624	31,033	— 1	— 14	— 12		b	b	b	b	b
PRICES												
Consumer Price Index[15]:												
All Urban Consumers		b	b	b	b	b	*1967*	248	245	+ 1	+ 14	+ 14
Wage Earners & Clerical Workers		b	b	b	b	b	*1967*	248	245	+ 1	+ 14	+ 14
Producer Price Index[10]:												
All Commodities		b	b	b	b	b	*1967*	265	264	+ 1	+ 14	+ 15
Finished Goods		b	b	b	b	b	*1967*	243	241	+ 1	+ 14	+ 13
Intermediate Materials		b	b	b	b	b	*1967*	278	276	+ 1	+ 16	+ 17
Crude Materials		b	b	b	b	b	*1967*	300	301	— x	+ 6	+ 9
Sensitive Indus. Commodities[15]		b	b	b	b	b	*1967*	268	279	— 4	— 9	+ 6
BANKING AND FINANCE												
• Bank Loans, Large Banks—Total[11]	*Mil. Dol.*	25,605	25,168	+ 2	+ 19	+ 20	*Mil. Dol.*	406,560	404,287	+ 1	+ 7	+ 12
" " " " Bus. & Agric.[11]	*Mil. Dol.*	9,072	9,127	— 1	+ 13	+ 18	*Mil. Dol.*	163,334	161,940	+ 1	+ 9	+ 14
Stock Price Index—400 Indust.[23]		b	b	b	b	b	*1941–43 = 10*	130.4	121.0	+ 8	+ 16	+ 11
" " " 40 Utils.[23]		b	b	b	b	b	*1941–43 = 10*	54.0	50.1	+ 8	+ 6	— 1
" " " 20 Trans.[23]		b	b	b	b	b	*1970 = 10*	16.4	15.2	+ 8	+ 11	+ 13
Yield, Corp. AAA Bonds[23]		b	b	b	b	b	*Percent*	9.90	10.78	— 8	+ 9	+ 22

• Indicates series charted (page S-1). For sources and footnotes, see page S-3.

Business Conditions in the 8 Largest OHIO CITIES

ITEM	Unit or Index Base Period	June 1980 (p)	May 1980 (r)	Change From Last Year: June 1980 from June 1979	Change From Last Year: 6 months 1980 from 1979
AKRON					
Number Employed[7]:				%	%
Total*	1967	79	79	— 7	— 5
Manufacturing	"	55	56	— 14	— 11
Trade, Serv., & Utils.	"	111	109	— 3	— 1
Construction	"	68	50	— 8	— 11
Payrolls[7]:					
Total*	"	175	173	+ 2	+ 2
• Manufacturing	"	126	128	— 1	— 3
Trade, Serv., & Utils.	"	267	264	+ 5	+ 6
Construction	"	173	122	+ 1	4
Emp. Earn.—Gross Wkly.[7]:					
All Industries*	$	337.41	332.73	+ 12	+ 9
Manufacturing	"	398.25	390.64	+ 15	+ 10
Trade, Serv., & Utils.	"	249.26	249.03	+ 8	+ 7
Construction	"	481.94	467.78	+ 8	+ 8
Retail Sales[2]	%	c	c	— 3	— 2
Auto Titles[3]:					
New Cars	No.	n.a.	n.a.	n.a.	n.a.
New Trucks	"	n.a.	n.a.	n.a.	n.a.
Retail Food Prices[15]	1967	b	b	b	b
Bank Debits[5]	1967†	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967†	125	130	— 17	— 10
Value of Bldg. Const.[9]:					
Total	"	118	121	— 40	— 35
Residential	"	64	162	— 75	— 41
Nonresidential	"	172	79	+ 25	— 30
Steel Production[18]	1967‡	b	b	b	b
Labor Force Estimates[14]:					
Civilian Labor Force	Thous.	244.1	241.5	+ 1	+ x
Civilian Employment	"	222.1	222.0	— 2	— 1
Unemp. Total—No.	"	22.0	19.5	+ 44	+ 21
Unemp., Total—Rate	%	9.0	8.1		
CANTON					
Number Employed[7]:				%	%
Total*	1967	91	92	— 9	— 5
Manufacturing	"	80	83	— 13	— 8
Trade, Serv., & Utils.	"	110	109	— 4	— 1
Construction	"	74	75	— 12	— 9
Payrolls[7]:					
Total*	"	224	228	— 8	— 1
• Manufacturing	"	189	202	— 15	— 5
Trade, Serv., & Utils.	"	315	302	+ 2	+ 5
Construction	"	191	172	+ 6	+ 7
Emp. Earn.—Gross Wkly.[7]:					
All Industries*	$	318.19	318.75	+ x	+ 3
Manufacturing	"	343.48	351.71	— 3	+ 2
Trade, Serv., & Utils.	"	260.06	252.24	+ 5	+ 4
Construction	"	465.33	432.87	+ 7	+ 8
Retail Sales[2]	%	c	c	— 4	— x
Auto Titles[3]:					
New Cars	No.	n.a.	n.a.	n.a.	n.a.
New Trucks	"	n.a.	n.a.	n.a.	n.a.
Retail Food Prices[15]	1967	b	b	b	b
Bank Debits[5]	1967†	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967†	b	b	b	b
Value of Bldg. Const.[9]:					
Total	"	114	230	— 48	— 20
Residential	"	106	78	— 63	— 46
Nonresidential	"	123	416	— 6	+ 18
Steel Production[18]	1967‡	b	b	b	b
Labor Force Estimates[14]:					
Civilian Labor Force	Thous.	177.9	175.4	+ 4	+ 2
Civilian Employment	"	160.3	159.0	— 1	+ x
Unemp. Total—No.	"	17.6	14.4	+ 89	+ 36
Unemp., Total—Rate	%	9.9	8.3		
CINCINNATI					
Number Employed[7]:				%	%
Total*	1967	88	87	— 10	— 8
Manufacturing	"	62	62	— 17	— 17
Trade, Serv., & Utils.	"	116	113	— 5	+ x
Construction	"	75	67	— 18	— 13
Payrolls[7]:					
Total*	"	229	214	— 6	— 6
• Manufacturing	"	153	151	— 18	— 18
Trade, Serv., & Utils.	"	330	301	+ 3	+ 5
Construction	"	215	172	— 8	— 6
Emp. Earn.—Gross Wkly.[7]:					
All Industries*	$	299.82	284.21	+ 4	+ 2
Manufacturing	"	345.19	334.50	+ 3	+ 2
Trade, Serv., & Utils.	"	233.04	216.91	+ 5	+ 2
Construction	"	506.53	450.72	+ 13	+ 9
Retail Sales[2]	%	c	c	— 1	+ 1
Auto Titles[3]:					
New Cars	No.	4,101	3,690	— 25	— 21
New Trucks	"	537	562	— 29	— 38
Retail Food Prices[15]	1967	264	265	+ 7	+ 6
Bank Debits[5]	1967†	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967†	b	b	b	b
Value of Bldg. Const.[9]:					
Total	"	74	198	— 75	— 40
Residential	"	73	214	— 40	— 46
Nonresidential	"	75	182	— 83	— 36
Steel Production[18]	1967‡	79	94	— 29	— 13
Labor Force Estimates[14]:					
Civilian Labor Force	Thous.	431.6	421.3	— 1	— 2
Civilian Employment	"	399.1	392.2	— 3	— 3
Unemp. Total—No.	"	32.5	29.1	+ 46	+ 15
Unemp., Total—Rate	%	7.5	6.9		
CLEVELAND					
Number Employed[7]:				%	%
Total*	1967	84	84	— 11	— 7
Manufacturing	"	59	60	— 25	— 16
Trade, Serv., & Utils.	"	109	109	— x	+ x
Construction	"	73	64	— 10	— 5
Payrolls[7]:					
Total*	"	191	186	— 10	— 5
• Manufacturing	"	126	125	— 29	— 20
Trade, Serv., & Utils.	"	273	268	+ 7	+ 8
Construction	"	216	173	+ x	+ 4
Emp. Earn.—Gross Wkly.[7]:					
All Industries*	$	354.12	344.78	+ 2	+ 2
Manufacturing	"	368.69	359.07	— 4	— 3
Trade, Serv., & Utils.	"	320.30	315.13	+ 8	+ 8
Construction	"	540.83	493.28	+ 11	+ 10
Retail Sales[2]	%	c	c	— 9	— 4
Auto Titles[3]:					
New Cars	No.	5,852	6,046	— 39	— 27
New Trucks	"	543	661	— 46	— 37
Retail Food Prices[15]	1967	246	249	+ 2	+ 4
Bank Debits[5]	1967†	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967†	b	b	b	b
Value of Bldg. Const.[9]:					
Total	"	140	38	— 5	— 2
Residential	"	67	39	— 48	— 42
Nonresidential	"	206	37	+ 25	+ 25
Steel Production[18]	1967‡	97	106	— 32	— 14
Labor Force Estimates[14]:					
Civilian Labor Force	Thous.	752.7	734.5	+ x	— 2
Civilian Employment	"	690.3	678.3	— 3	— 3
Unemp. Total—No.	"	62.4	56.2	+ 67	+ 27
Unemp., Total—Rate	%	8.3	7.7		
COLUMBUS					
Number Employed[7]:				%	%
Total*	1967	98	97	— 3	— 4
Manufacturing	"	65	59	— 4	— 11
Trade, Serv., & Utils.	"	122	123	— 3	— 2
Construction	"	69	67	— 10	+ 4
Payrolls[7]:					
Total*	"	241	229	+ 5	+ 3
• Manufacturing	"	138	127	— 7	— 9
Trade, Serv., & Utils.	"	336	325	+ 10	+ 7
Construction	"	185	167	+ 7	+ 17
Emp. Earn.—Gross Wkly.[7]:					
All Industries*	$	292.66	282.06	+ 7	+ 7
Manufacturing	"	341.75	335.33	+ 1	+ 4
Trade, Serv., & Utils.	"	243.82	235.03	+ 10	+ 7
Construction	"	445.15	398.40	+ 19	+ 13
Retail Sales[2]	%	c	c	— 5	— 4
Auto Titles[3]:					
New Cars	No.	3,839	3,551	— 24	— 20
New Trucks	"	689	758	— 32	— 25
Retail Food Prices[15]	1967	b	b	b	b
Bank Debits[5]	1967†	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967†	b	b	b	b
Value of Bldg. Const.[9]:					
Total	"	118	114	— 48	— 36
Residential	"	185	120	— 10	— 29
Nonresidential	"	51	108	— 79	— 41
Steel Production[18]	1967‡	b	b	b	b
Labor Force Estimates[14]:					
Civilian Labor Force	Thous.	438.6	429.8	+ x	— 1
Civilian Employment	"	411.5	405.7	— 1	— 1
Unemp. Total—No.	"	27.1	24.2	+ 18	— 3
Unemp., Total—Rate	%	6.2	5.6		
DAYTON					
Number Employed[7]:				%	%
Total*	1967	100	99	— 10	— 4
Manufacturing	"	57	58	— 23	— 13
Trade, Serv., & Utils.	"	160	160	— 3	+ 1
Construction	"	108	89	+ 8	+ 3
Payrolls[7]:					
Total*	"	200	194	— 9	— 2
• Manufacturing	"	125	123	— 26	— 12
Trade, Serv., & Utils.	"	347	346	+ 8	+ 9
Construction	"	288	215	+ 15	+ 12
Emp. Earn.—Gross Wkly.[7]:					
All Industries*	$	353.33	344.98	+ x	+ 3
Manufacturing	"	382.34	372.12	— 6	— x
Trade, Serv., & Utils.	"	296.67	295.10	+ 11	+ 8
Construction	"	475.50	433.75	+ 6	+ 9
Retail Sales[2]	%	n.a.	n.a.	n.a.	n.a.
Auto Titles[3]:					
New Cars	No.	1,988	2,013	— 41	— 23
New Trucks	"	283	275	— 50	— 52
Retail Food Prices[15]	1967	b	b	b	b
Bank Debits[5]	1967†	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967†	b	b	b	b
Value of Bldg. Const.[9]:					
Total	"	65	107	— 68	+ 2
Residential	"	36	48	— 83	— 59
Nonresidential	"	102	180	— 47	+ 67
Steel Production[18]	1967‡	b	b	b	b
Labor Force Estimates[14]:					
Civilian Labor Force	Thous.	275.3	269.2	+ x	— 1
Civilian Employment	"	249.2	246.3	— 2	— 2
Unemp. Total—No.	"	26.1	22.9	+ 32	+ 21
Unemp., Total—Rate	%	9.5	8.5		
TOLEDO					
Number Employed[7]:				%	%
Total*	1967	89	86	— 15	— 12
Manufacturing	"	54	49	— 39	— 32
Trade, Serv., & Utils.	"	122	121	+ x	+ 1
Construction	"	87	83	— x	+ 10
Payrolls[7]:					
Total*	"	217	204	— 10	— 9
• Manufacturing	"	126	110	— 33	— 32
Trade, Serv., & Utils.	"	338	331	+ 8	+ 8
Construction	"	230	207	+ 8	+ 18
Emp. Earn.—Gross Wkly.[7]:					
All Industries*	$	359.13	344.23	+ 13	+ 7
Manufacturing	"	394.86	382.08	+ 11	+ 2
Trade, Serv., & Utils.	"	307.20	292.42	+ 17	+ 13
Construction	"	518.93	486.23	+ 4	+ 5
Retail Sales[2]	%	c	c	— 8	— 4
Auto Titles[3]:					
New Cars	No.	1,797	n.a.	— 34	n.a.
New Trucks	"	201	n.a.	— 51	n.a.
Retail Food Prices[15]	1967	b	b	b	b
Bank Debits[5]	1967†	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967†	131	128	— 17	— 13
Value of Bldg. Const.[9]:					
Total	"	198	76	— 71	— 52
Residential	"	39	180	— 74	— 48
Nonresidential	"	282	21	— 71	— 54
Steel Production[18]	1967‡	b	b	b	b
Labor Force Estimates[14]:					
Civilian Labor Force	Thous.	225.4	221.0	— 1	— 1
Civilian Employment	"	199.0	195.2	— 6	— 4
Unemp. Total—No.	"	26.4	25.7	+ 65	+ 44
Unemp., Total—Rate	%	11.7	11.6		
YOUNGSTOWN					
Number Employed[7]:				%	%
Total*	1967	78	80	— 9	— 5
Manufacturing	"	47	49	— 21	— 14
Trade, Serv., & Utils.	"	119	119	— 2	— 1
Construction	"	53	52	+ 1	— 1
Payrolls[7]:					
Total*	"	186	184	— 1	+ 1
• Manufacturing	"	123	126	— 15	— 8
Trade, Serv., & Utils.	"	309	300	+ 9	+ 9
Construction	"	150	139	+ 24	+ 6
Emp. Earn.—Gross Wkly.[7]:					
All Industries*	$	329.97	321.05	+ 8	+ 6
Manufacturing	"	374.40	365.45	+ 6	+ 5
Trade, Serv., & Utils.	"	254.97	249.30	+ 10	+ 10
Construction	"	489.31	457.54	+ 16	+ 4
Retail Sales[2]	%	c	c	— 13	— 5
Auto Titles[3]:					
New Cars	No.	1,016	987	— 37	— 28
New Trucks	"	142	111	— 54	— 37
Retail Food Prices[15]	1967	b	b	b	b
Bank Debits[5]	1967†	n.a.	n.a.	n.a.	n.a.
Commercial Failures[12]:					
Failures	No.	n.a.	n.a.	n.a.	n.a.
Liabilities	Thous. $	n.a.	n.a.	n.a.	n.a.
Indus. Power Consump.[4]	1967†	70	71	— 19	— 14
Value of Bldg. Const.[9]:					
Total	"	111	114	— 74	— 43
Residential	"	154	74	— 68	— 60
Nonresidential	"	60	162	— 83	— 21
Steel Production[18]	1967‡	42	54	— 53	— 29
Labor Force Estimates[14]:					
Civilian Labor Force	Thous.	132.0	129.3	+ 1	— 1
Civilian Employment	"	115.5	114.1	— 6	— 4
Unemp. Total—No.	"	16.5	15.2	+ 85	+ 39
Unemp., Total—Rate	%	12.5	11.7		

NOTE: All data are for county areas except bank debits and commercial failures, which are for areas within city limits. The indexes of number employed and payrolls and the employee weekly earnings are based on data for production workers in manufacturing, construction workers in contract construction, and nonsupervisory employees in other categories which exclude agriculture, government, education, and public institutions.

• Indicates series charted (page S-1). For sources and footnotes, see page S-3.

Number Employed, Payrolls, and Man-Hours in Ohio Industry

INDUSTRIAL GROUP	NUMBER EMPLOYED[7]					PAYROLLS[7]					MAN-HOURS[7]				
	INDEX (1967 = 100)		CHANGE			INDEX (1967 = 100)		CHANGE			INDEX (1967 = 100)		CHANGE		
	June 1980 (p)	May 1980 (r)	June 1980 from May 1980	June 1980 from June 1979	6 months 1980 from 1979	June 1980 (p)	May 1980 (r)	June 1980 from May 1980	June 1980 from June 1979	6 months 1980 from 1979	June 1980 (p)	May 1980 (r)	June 1980 from May 1980	June 1980 from June 1979	6 months 1980 from 1979
			%	%	%			%	%	%			%	%	%
Total[w] (2,198)[a]	**84**	**83**	+ x	— 9	— 6	**192**	**187**	+ 3	— 5	— 2	**81**	**79**	+ 2	— 10	— 7
All Manufacturing[w] (1,179)	**68**	**68**	— x	— 16	— 12	**157**	**157**	+ x	— 15	— 10	**62**	**62**	— x	— 20	— 15
Chemicals (62)	97	96	+ x	— 3	— 7	210	211	— x	— 5	— 10	90	89	+ 1	— 9	— 12
Food Products (77)	80	78	+ 3	+ 2	— 1	200	194	+ 3	+ 8	+ 8	71	69	+ 3	— x	— 1
Bakery	76	76	+ 1	— 3	— 1	192	188	+ 2	+ 7	+ 9	73	74	— 1	— 6	— 1
Miscellaneous	80	78	+ 3	+ 2	— 1	200	194	+ 3	+ 8	+ 8	70	67	+ 3	+ x	— 1
Lumber Products (37)	80	84	— 5	— 19	— 14	169	176	— 4	— 11	— 4	71	74	— 4	— 20	— 13
Furniture	88	94	— 6	— 19	— 14	188	195	— 4	— 8	— 2	83	87	— 5	— 19	— 12
Miscellaneous	67	67	— 1	— 21	— 15	140	147	— 5	— 17	— 8	55	56	— 3	— 23	— 16
Machinery (271)	66	67	— 2	— 10	— 6	147	150	— 2	— 7	+ 1	63	63	— x	— 12	— 7
Elec. Mach., Apparatus and Supplies	72	73	— 1	— 12	— 5	166	170	— 3	— 9	+ 2	70	68	+ 2	— 11	— 6
Machine Tools	62	62	+ 1	— 3	— 1	146	143	+ 2	+ 3	+ 8	62	62	+ x	— 6	— 1
Agricultural Equipment	44	32	+ 36	— 17	— 19	96	76	+ 27	— 17	— 11	47	35	+ 35	— 21	— 20
Special Machinery and Appliances	61	64	— 6	— 10	— 8	127	133	— 4	— 7	— 3	55	59	— 6	— 14	— 11
Metal Products (321)	73	72	+ 1	— 19	— 13	168	164	+ 2	— 19	— 11	63	62	+ x	— 25	— 17
Foundry Products and Drop Forgings	78	67	+ 16	— 24	— 19	194	152	+ 27	— 26	— 21	61	52	+ 19	— 30	— 24
Pipes, Valves, and Plumbers' Supplies	57	48	+ 20	— 36	— 23	136	115	+ 19	— 38	— 19	59	51	+ 17	— 41	— 26
Screw Machine Products and Hdwe.	78	75	+ 4	— 22	— 14	140	135	+ 4	— 24	— 16	70	68	+ 2	— 30	— 21
Sheet Metal Work	74	77	— 4	— 26	— 20	174	169	+ 3	— 24	— 17	61	63	— 2	— 29	— 22
Steel Works and Rolling Mills	70	75	— 6	— 14	— 7	156	167	— 7	— 16	— 5	61	65	— 6	— 22	— 13
Stoves and Furnaces	51	65	— 20	— 52	— 32	98	131	— 25	— 53	— 26	54	68	— 21	— 53	— 32
Miscellaneous	71	68	+ 5	— 16	— 13	164	155	+ 5	— 14	— 8	60	58	+ 3	— 19	— 14
Paper and Printing (125)	61	61	— x	— 7	— 6	155	154	+ 1	— 3	+ 1	55	56	— x	— 11	— 8
Paper and Pulp	46	44	+ 3	— 8	— 4	148	147	+ 1	— 5	+ 4	37	37	— x	— 14	— 6
Printing and Publishing	74	74	— x	— 7	— 6	171	170	+ x	— 4	— 2	68	68	+ x	— 8	— 6
Miscellaneous	60	61	— 2	— 5	— 6	147	146	+ 1	— 1	+ x	59	59	— 1	— 10	— 10
Rubber Products (50)	55	56	— 2	— 25	— 17	133	132	+ x	— 26	— 16	49	49	— 1	— 30	— 21
Tires and Tubes	45	47	— 3	— 12	— 9	99	101	— 2	— 9	— 9	33	33	— 2	— 17	— 15
Miscellaneous	60	61	— 1	— 30	— 20	157	154	+ 2	— 34	— 19	61	61	+ x	— 36	— 23
Stone, Clay, and Glass Products (88)	67	69	— 3	— 13	— 7	167	177	— 5	— 7	— 1	70	75	— 6	— 15	— 8
Brick and Tile	47	51	— 8	— 25	— 15	93	106	— 12	— 25	— 11	44	51	— 13	— 29	— 17
Glass	72	76	— 4	— 10	— 5	164	178	— 8	— 7	— 1	70	77	— 9	— 12	— 6
Vitreous & Semi-vit. China & Pottery	50	51	— 2	— 13	— 5	156	158	— 1	+ 3	+ 7	76	78	— 3	— 11	— 5
Miscellaneous	79	79	— x	— 13	— 7	211	209	+ 1	— 8	— 3	80	80	— x	— 17	— 11
Textiles (37)	72	69	+ 5	— 7	— 8	108	102	+ 6	— 7	— 6	67	64	+ 4	— 15	— 12
Men's Clothing	82	82	+ 1	— 3	— 4	109	110	— x	— 4	— 4	71	72	— 1	— 11	— 11
Miscellaneous	67	61	+ 9	— 9	— 11	111	99	+ 12	— 10	— 8	65	60	+ 8	— 17	— 12
Vehicles (58)	56	56	+ 1	— 40	— 34	140	135	+ 4	— 39	— 37	49	48	+ 2	— 43	— 39
Autos and Parts	58	56	+ 3	— 46	— 41	150	141	+ 6	— 45	— 43	50	48	+ 4	— 49	— 46
Cars, Electric and Steam Railway	88	95	— 7	— 24	— 8	209	223	— 6	— 23	— 5	77	86	— 11	— 34	— 13
Miscellaneous	58	60	— 4	+ 13	+ 21	134	138	— 3	+ 24	+ 34	56	59	— 4	+ 9	+ 19
Miscellaneous Manufacturing (53)	58	59	— 2	— 14	— 9	135	137	— 2	— 2	+ 3	54	55	— 2	— 13	— 8
Total Trade, Service, and Utilities[w] (666)	**102**	**102**	+ x	— 3	— 1	**243**	**238**	+ 2	+ 6	+ 7	**108**	**104**	+ 3	— 3	— 1
Service (198)	128	126	+ 1	+ x	+ 3	274	265	+ 3	+ 11	+ 11	147	137	+ 7	+ x	+ 3
Trade, Retail and Wholesale (366)	87	87	— 1	— 6	— 4	206	203	+ 2	+ 2	+ 3	87	86	+ 1	— 6	— 4
Transportation & Public Utilities (102)	108	108	— x	— 1	+ x	301	296	+ 2	+ 8	+ 9	108	106	+ 1	— 1	— x
Construction (325)	**73**	**65**	+ 12	— 4	— 2	**207**	**169**	+ 23	+ 12	+ 12	**71**	**59**	+ 20	+ 2	+ 4
Mines and Quarries (28)	**130**	**127**	+ 2	+ 2	— 1	**299**	**291**	+ 3	+ 12	+ 10	**80**	**79**	+ 2	+ x	— 1

Indexes of number employed and of payrolls are based on the employment of 439,215 persons (production workers in manufacturing and mining, construction workers in contract construction, and nonsupervisory employees in other categories) in 2,198 firms; indexes of man-hours, on the employment of 425,067 production workers and nonsupervisory employees in 2,097 firms. Figures in parentheses show number of firms reporting employment and payrolls. In some cases fewer firms report man-hours. Data do not include agriculture, government, education, or public institutions. For sources and footnotes, see below.

FOOTNOTES FOR BULLETIN TABLES AND CHARTS

[†]Change in number of failures; [a]Figures in parentheses show number of firms reporting this month; [n.a.]Current data not available; [b]Comparable data not available; [c]Only percentage of change available; [d]Adjusted for seasonal change; [f]Adjusted for number of working days; [g]Four weeks average; [h]Annual rate; [p]Preliminary; [r]Revised; [s]Series revised; [w]Weighted; [x]Less than 0.5 percent; [y]More than 1,000 percent increase.

Primary Sources:

Computed from: [1]Center for Business and Economic Research multiple regression model.

Computed from original data collected by the Center for Business and Economic Research from: [2]Ohio retailers; [3]County Clerks of Courts; [4]Local Power and Light Companies.

Computed by the Center for Business and Economic Research from data supplied by: [5]Board of Governors of the Federal Reserve System; [6]Life Insurance Marketing and Research Association; [7]Division of Research and Statistics of the Ohio Bureau of Employment Services, collected in cooperation with the Bureau of Labor Statistics, U.S. Department of Labor; [8]Federal Power Commission; [9]F. W. Dodge Division, McGraw-Hill Information Systems Company; [10]Dun & Bradstreet, Inc.

Other data sources: [11]Federal Reserve Board; [12]Dun & Bradstreet, Inc.; [13]U.S. Department of Commerce; [14]Division of Research and Statistics of the Ohio Bureau of Employment Services; [15]U.S. Department of Labor; [16]Department of Agricultural Economics, O.S.U.; [17]U.S. Department of Agriculture; [18]American Iron and Steel Institute; [19]U.S. Department of Energy; [20]National Machine Tool Builders' Association; [21]F. W. Dodge Division, McGraw-Hill Information Systems Company; [22]R. L. Polk & Co.; [23]Standard & Poor's Corporation.

Note: In the Ohio-U.S. table, page S-1, dual source notes on a single line of the table stub refer first to Ohio data, second to U.S. data.

Ohio Retail Sales Trends

Sales of Ohio Retailers in June were 6 percent lower than sales in May, both before and after adjustment for seasonal variation. June sales this year also were 6 percent lower than June sales in 1979.

For the First Half of 1980, total retail sales were less than 0.5 percent below sales in the first half of 1979. A composite index of "total sales *excluding* motor vehicles," which was computed to show the effect of a 20 percent decline in motor vehicle sales in the first half of 1980, showed an increase of 5 percent in the first half of 1980 compared with sales without vehicles in the first half of 1979.

By Kind of Business, sales in the first half of 1980 were higher than 6-month sales last year in 14 of the 22 lines shown individually—and ranged from a 29 percent gain in general stores to a 1 percent increase in eating and drinking places. Among the 8 kinds of business with first-half declines from 1979, the degree of decline ranged from the 20 percent drop in motor vehicles to a fractional decline in men's clothing stores.

BULLETIN OF BUSINESS RESEARCH

Published Monthly at The Ohio State University
Columbus, Ohio

PHILIP M. CARROLL, *Editor*
ROY F. CROMER, *Associate Editor*

Copyright, 1980, by The Ohio State University

EDITORIAL ADVISORY BOARD

JAMES W. DUNLAP, *The University of Akron*
RAYMOND F. BARKER, *Bowling Green State University*
JOSEPH BLACKSHERE, *Central State University*
JOSEPH L. CRAYCRAFT, *University of Cincinnati*
JAN MUCZYK, *Cleveland State University*
JOHN PACILIO, JR., *Kent State University*
ROBERT H. MYERS, *Miami University*
JAMES A. LEE, *Ohio University*
THOMAS A. KLEIN, *University of Toledo*
ROBERT DOLPHIN, JR., *Wright State University*
RAMA KRISHNAN, *Youngstown State University*

Subscription Rates: $4.00 for 1 year; $7.00 for 2 years

INDEXES OF OHIO RETAIL SALES

KIND OF BUSINESS	UNADJUSTED INDEX (1957–59 = 100)		CHANGE			
			June 1980 from May 1980		June 1980 from June 1979	6 months 1980 from 1979
	June 1980 (p)	May 1980 (r)	Not Seas. Adj.	Seas. Adj.		
			%	%	%	%
Total Retail Stores[a] [b]	**278**	**297**	**— 6**	**— 6**	**— 6**	**— x**
Grocery Stores	325	346	— 6	— 7	— 2	+ 9
Other Food Stores	406	375	+ 8	+10	+ 8	+11
General Stores (With Food)	174	183	— 5	— 9	+20	+29
Department Stores	242	241	+ x	+ 6	— 3	+ 2
Other General Merchandise	211	275	—23	—22	+ 1	+14
Men's Clothing-Furns. Stores	113	122	— 8	—15	— 9	— x
Family Clothing Stores	136	155	—12	— 7	— 7	+ 6
Women's Ready-to-Wear Stores	128	135	— 5	+ 6	— 8	— 2
Shoe Stores	99	108	— 8	— 8	— 5	— x
Furniture Stores	198	211	— 6	— 2	—11	— 1
Household Appl.-TV-Rdio Strs.	182	165	+10	+ 2	— 1	— 2
Home Furnishings Stores	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Motor Vehicle Dealers	320	286	+12	+11	—16	—20
Other Automotive	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Filling Stations	377	441	—15	—15	— x	+ 7
Lumber-Bldg. Matls. Dealers	253	245	+ 3	— 5	—27	—14
Paint, Glass & Wallpaper Strs.	236	208	+14	— 1	— 1	+13
Heat.-Plumb. & Elec. Sup. Strs.	214	192	+11	— 4	— 2	+10
Hardware Stores	261	287	— 9	— 8	— 3	+ 2
Farm Equipment Dealers	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Eating & Drinking Places	191	220	—13	—11	— 8	+ 1
Drug Stores	274	299	— 8	— 6	+ 3	+15
Jewelry Stores	180	191	— 6	—11	— 1	+ 7
Florists	168	285	—41	—13	— 4	— 3
Fuel Dealers	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Hay-Feed, Farm & Grdn. Strs.	474	736	—36	—20	+24	+12
State Liquor Stores	205	178	+15	+13	+23	+ 9

For sources and footnotes, see page S-3.

Chrysler and the Ohio Economy (Continued from page 4)

Further evidence on very extensive automotive scale economies is presented by John McGee in a thorough investigation of auto body manufacture.[22] The major issue between McGee and White is whether dies used in auto body manufacture do in fact wear out. McGee, as had Rhys, found that what appear to be changes in designs of auto bodies are accomplished through modifications of existing dies. He states:

> I have personally inspected many dies, each of which has already produced several millions of parts. They are still in production. None has "worn out" . . . Several millions of units, not 400,000 units [the White estimate] is the volume limit for auto panels, if indeed any exist.[23]

McGee concludes that with present body plant technology no automotive firm has achieved large enough output (on a rate per year basis or total volume of units produced of a given model) to exhaust the technical scale economies.[24] The Rhys and McGee conclusions, therefore, help explain the increased concentration in the world automobile industry since the end of World War II. Examples of the concentration include the merger of Nash and Hudson and later Jeep into American Motors; the Studebaker-Packard merger; and in Europe the Peugeot-Citroen combination which now includes the former Chrysler-European operations (Rootes in England and Simca in France). These combinations are a result of the need to exploit the extensive scale economies in the industry.

Finally, McGee's findings are consistent with the theories of John Menge advanced in 1962. Briefly, Menge concluded that the necessity and cost of making frequent style changes to attract consumers made it difficult for smaller automobile manufacturers to survive with low volumes of output.[25]

Chrysler Survival and Scale Economies

The Rhys and McGee conclusions have very serious implications for the long-term survival strategy of the Chrysler Corporation. The current financial problems of Chrysler can be understood in the context of the scale economy discussion. Chrysler has lost both absolute and relative auto market share during the last seven years (see Table 5). If Chrysler is to survive, it must arrange its production capabilities to achieve maximum rates of output. In addition, its marketing and designing efforts must be concentrated on achieving high volumes of model output without frequent design changes in order to exploit product-specific scale economies.

Because of its financial crisis and reduced market penetration, Chrysler has begun to undertake actions to use some facilities more intensively (i.e., at higher rates). As a result, redundant plants have been closed.

Among the facilities closed has been the Hamtramck, Michigan plant which produced Volare and Aspen models. The almost 70-year-old plant was closed at the end of 1979.[26]

At present, the future of the Lynch Road assembly plant in Detroit is uncertain. In 1979, $57 million of reconstruction was undertaken at Lynch Road as part of a $250 million project to downsize 1979 large Dodge St. Regis and Chrysler Newport and New Yorker models.[27] Table 7 indicates that output at Lynch Road (109,007 in 1979) was only half that traditionally assumed to be needed to achieve M.O.S. in auto assembly.

On May 18, 1980, Chrysler announced it would close Lynch Road.[28] Then on June 30, 1980, Chrysler announced it would keep Lynch Road open at least until December 1980, to produce some 1981 large cars. Apparently, reversal of the decision came as a result of pressure from dealers to continue the larger cars and discussion with the United Auto Workers in an attempt to save jobs.[29]

New-car tooling and plant reconversion costs are usually recovered over a five- to six-year period. If Chrysler closes Lynch Road after only about two years of low production rates, the cost per unit produced of the larger cars will be relatively high.

Other assembly plant closings reflect changes in the truck production expectations of Chrysler. In the past year it has made the decision to close two of its three U.S. truck assembly plants. (Production of Chrysler's light trucks and vans uses technology similar to auto assembly.)

Until 1979, Chrysler had two truck assembly plants—Warren, Michigan and Fenton, Missouri. The expanding light truck market in the mid-1970's led to conversion of the Jefferson Avenue auto assembly plant to van assembly in 1979. However, truck and van sales fell in 1979 and 1980 (see Table 5). Therefore, Chrysler decided to reconvert its Jefferson Avenue plant to auto assembly and close the Fenton, Missouri plant in the summer of 1980.[30]

The reduced output of Chrysler has meant that some facilities which support assembly operations have had to be closed as well. Closed in August 1980 was the Windsor, Ontario engine plant which made large V-8 engines.[31] In April 1980 the Fostoria, Ohio foundry was closed. Another Chrysler plant closed in the past year was the Lyons, Michigan trim plant.[32]

It was suggested earlier that new technologies could raise the M.O.S. rate of output in automobile assembly. Indeed, the highly automated Chrysler Belvidere, Illinois plant appears to have an M.O.S. of about 300,000 units annually (see Table 7). For 1981, Chrysler plans to introduce two new front-wheel drive downsized compact cars called the Plymouth Reliant and Dodge Aries (code name "K-cars") to replace the Volare and Aspen, respectively. Output capabilities will be 600,000 units per year from two assembly plants (Newark and Jefferson Avenue).[33] These figures would imply output of about 300,000 from each of the plants which in the past produced only two-thirds that number (see Table 7).

(Continued on page 6)

Chrysler and the Chio Economy (Continued from page 5)

TABLE 7
CHRYSLER CORPORATION AUTOMOTIVE PLANTS PRODUCTION RATES, 1978 AND 1979[a]

Assembly Plant	Models Produced	Output 1979	Output 1978
Belvidere, Illinois	Horizon, Omni	318,073	288,236
Hamtramck, Michigan	Aspen, Volare	(est.) 150,000	195,245
Newark, Delaware	Aspen, Volare	162,592	189,167
St. Louis, Missouri	Le Baron, Diplomat, Caravelle	163,501	231,156
Lynch Road (Detroit)[b]	St. Regis, Newport, New Yorker (1978 figure includes Monaco and Fury models)	109,007	134,784
Jefferson Ave. (Detroit)[c]		.....	43,687
Total		903,173	1,082,275
Average output per auto assembly plant		180,635	180,379

[a] *Automotive News, Market Data Book*, 1980 (Detroit: Crain Publications, April 30, 1980) and Motor Vehicle Manufacturers Association, *Motor Vehicle Facts and Figures*, 1979 (Detroit: Motor Vehicle Manufacturers Association, 1979), p. 19.

[b] 1978 figures include large size Chrysler Newports and New Yorker, and intermediate Dodge Monaco, and Plymouth Fury; 1979 figures reflect production of only large cars (Dodge St. Regis and Chrysler Newports and New Yorkers).

[c] Converted to light truck production for 1979 model year.

New technology, in the form of automatic welding machines (robot welders) and computerized materials handling and painting equipment, has been installed in these plants. The Jefferson Avenue plant reconversion cost $100 million and the Newark renovations cost $50 million. The improved technology will raise output from 60 cars per hour maximum to 70 units per hour, or about 300,000 per year capacity in each plant.[34] Added evidence of an increased rate of output for M.O.S. in auto assembly to 300,000 units annually is the G.M. announcement of a new Buick assembly plant with a capacity of 300,000 units per year.[35] In fact, G.M.'s Lordstown, Ohio auto assembly plant, highly automated and using "robot" welders, was producing over 300,000 units per year in the early 1970's.

The importance of both product-specific and plant-specific scale economies to Chrysler and its Ohio plants is evident in its decision to accelerate conversion to building practically all front-wheel drive vehicles. For the 1981 model year, about 50 percent of Chrysler's estimated production will be rear-wheel drive vehicles (a segment of the market that is generally considered to be declining).[36] Therefore, to the extent sales of these vehicles are depressed, Chrysler will not be able to take advantage of plant-specific scale economies in the plants manufacturing these units.

At present (1980), Chrysler has four basic vehicles: (1) Omni/Horizon; (2) Aspen/Volare/Diplomat/Le Baron; (3) large Dodges, Plymouths, and Chryslers; and (4) vans and light trucks. Chrysler needs to reduce dependency on rear-wheel drive vehicles and take advantage of product-specific scale economies by sharing components across several vehicle lines which can be produced for long periods of time. Chrysler has announced that by Fall 1982 it will be selling essentially only front-wheel drive vehicles. These will be in two basic vehicle lines: (1) Omni/Horizon and (2) "K-car" and its derivatives—i.e., "stretched" variations to replace Le Baron and Diplomat and modifications to produce front-wheel drive vans and trucks.[37]

Conclusion

Chrysler should have the capability to achieve plant-specific scale economies with very efficient assembly plants if the "K-cars" are successful in the market. Furthermore, the closing and consolidation of engine and parts plants indicate Chrysler is attempting to improve the rates of output in these plants to take advantage of scale economies.

However, efficient rates of output are only part of the story. Because Chrysler does not have the total volume of output that General Motors and Ford have, it is not able to move as far along a downward sloping unit cost curve as those firms. This is a particularly critical problem in auto body production where evidence suggests M.O.S. is achieved at only very large volumes of output if at all.

Even if Chrysler would re-attain 15 or 16 percent of the market (which would be a remarkable achievement if done in the short-run), it is unlikely it would exhaust all of its potential scale economies. It must find those market segments where its products can be produced with long product runs. Therefore, the Omni/Horizon and "K-car" derivatives will have to meet public acceptance without major redesign for several years to enable Chrysler to recover its costs of tooling.

It is unlikely that Chrysler will be in a position to redesign its products as frequently as its larger competitors. It must, of course, obtain enough consumer acceptance to sustain high rates of output on an annual basis to take advantage of plant-specific scale economies. But, it must also plan to produce basically the same models over a long period of time to generate sufficient volume to obtain product-specific scale economies.

If Chrysler is successful in this strategy it should remain a viable motor vehicle producer. Then Chrysler's remaining Ohio plants probably would continue in operation as part of the Chrysler Corporation. The Toledo, Twinsburg, Sandusky, and Van Wert plants are all modern enough to be essential to Chrysler as an on-going firm. The Dayton plant has been modernized recently and is Chrysler's only source of heaters and air conditioners. The Lima plant is essential to the national defense effort.

All of the plants might survive as parts of other firms in the event of a Chrysler shutdown. The optimal solution, though, would be to keep them operating as part of a viable Chrysler Corporation. Such operations would avoid potentially disruptive short-term social and economic adjustments in those regions of the state that have Chrysler facilities.

NOTES

[1] U.S. Congress, House, Subcommittee on Economic Stabilization of the Committee on Banking, Finance, and Urban Affairs, *Findings of the Chrysler Corporation Loan Guarantee Board*, 96th Congress, 2d. Session, Committee Print 96-13, May 12, 1980.

[2] Andy Pasztor, "U.S. Clears Chrysler Aid," *Wall Street Journal*, June 25, 1980, p. 2.

[3] Subcommittee on Economic Stabilization, p. 134.

[4] "Chrysler to Shut Fostoria Foundry in April, 1980," *Automotive News*, February 25, 1980, p. 4.

[5] *Ibid.*, p. 135.

[6] *Ibid.*, pp. 678, 716, 775, 683.

[7] *Ibid.*, pp. 679, 693, 778.

[8] *Ibid.*, pp. 728, 734.

[9] *Ibid.*, pp. 719, 744.

[10] *Chrysler Corporation, 1978 Annual Report* (Detroit: Chrysler Corporation, 1979), p. 8.

[11] Subcommittee on Economic Stabilization, pp. 681, 713, 771, 782.

[12] F. M. Scherer, "Economics of Scale and Industrial Concentration," in Harvey L. Goldschmid, H. Michael Mann, and J. Fred Weston, Eds., *Industrial Concentration, The New Learning* (Boston: Little, Brown, and Co., 1974), pp. 19-20.

[13] *Ibid.*, pp. 33-34. For a more complete discussion on the distinction between plant-specific and product-specific scale economies, see F. M. Scherer, Alan Beckenstein, Erich Kaufer, and R. Dennis Murphy, *The Economics of Multi-Plant Operation* (Cambridge, Mass.: Harvard University Press, 1975), pp. 49-56.

[14] Scale economies in truck production are not as easy to deal with. Truck sizes are not as homogeneous as automobiles and come in eight distinct Gross Vehicle Weight classes from light to heavy duty trucks. The conditions and means of producing trucks in the different classes are quite diverse ranging from mass produced light pickup trucks to custom built heavy duty units. The unique characteristics of scale economies in heavy truck production are being explored by the author in other research currently in process.

[15] Joe S. Bain, *Barriers in New Competition* (Cambridge, Mass.: Harvard University Press, 1956), p. 306.

[16] See Lawrence J. White, *The Automobile Industry Since 1945* (Cambridge Mass.: Harvard University Press, 1971), pp. 38-53, and D. G. Rhys, *The Motor Industry, An Economic Survey* (London: Butterworths, 1972, p. 283.

[17] Rhys, *The Motor Industry*, p. 283.

[18] Bain, *Barriers to New Competition*, pp. 244-45.

[19] White, *The Automobile Industry*, pp. 38-53.

[20] *Ibid.*, p. 53.

[21] Rhys, *The Motor Industry*, pp. 262-289.

[22] John S. McGee, "Economies of Scale in Auto Body Manufacture," *Journal of Law and Economics*, XVI (October 1973), pp. 239-273.

[23] *Ibid.*, p. 249-250.

[24] *Ibid.*, p. 273.

[25] Jack A. Menge, "Style Change Costs as a Market Weapon," *Quarterly Journal of Economics*, LXXVI (November 1962), pp. 632-647.

[26] "Chrysler Hamtramck Plant Closes Permanently June 4," *Automotive News*, December 17, 1979, p. 8.

[27] "Superplant," *Dodge Adventurer Magazine*, Fall 1978, pp. 29-30.

[28] "Chrysler Plant Closing in July Will Spell End to Firm's Role as Maker of Big Cars," *Wall Street Journal*, May 19, 1980, p. 4.

[29] "Chrysler Decides to Make Full-Size Autos at Least to Year End in Strategy Change," *Wall Street Journal*, June 4, 1980, p. 2, and Marjorie Sorge, "Dealers Saved Lynch Road, U.A.W. Reveals," *Automotive News*, June 30, 1980, p. 7.

[30] "Chrysler Announces Permanent Closings for Truck Facility and V8 Engine Plant," *Wall Street Journal*, May 13, 1980, p. 12.

[31] *Ibid.*

[32] Marjorie Sorge, "Chrysler Seals Big-Car Doom," *Automotive News*, May 19, 1980, p. 1.

[33] Roger Rowand, "Chrysler Keeps '81's on Target," *Automotive News*, May 26, 1980, p. 10.

[34] Jenny L. King, "Jefferson—A Brand New Old Plant," and "Newark Overhauled for K-car Output," *Automotive News*, July 7, 1980, pp. 28 and 30.

[35] "GM May Build New Buick Plant," *Automotive News*, June 30, 1980, p. 1.

[36] Subcommittee on Economic Stabilization, pp. 213-275.

[37] Andy Pasztor, "Chrysler Is Speeding Up Development of Fuel-Efficient Models Despite Risks," *Wall Street Journal*, July 3, 1980, p. 3.

ROBERT R. EBERT *is Associate Professor of Economics at Baldwin-Wallace College, Berea, Ohio.*